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Engineering Wage Dispute

THE Confederation of Shipbuilding & Engineering Unions decided last Sunday to recommend its constituent unions to stop all overtime and piecework in protest against the rejection by the employers of the Confederation claim for an additional £2 a week for all adult engineering workers. There is hope, as we go to press, that wiser counsels will prevail before the C.S.E.U. executives meet again next week. The National Union of General & Municipal Workers, a constituent of the Confederation, has recommended that the dispute be referred to the Minister of Labour for arbitration; many of this union's members would suffer heavy losses in pay if overtime and piecework were suspended, and there are other elements in the Confederation similarly placed. The C.S.E.U. recommendation, moreover, is supported by the Amalgamated Engineering Union, which has more votes than any other union in the Confederation, and by other principal unions. Some 3,000,000 workers are affected by the dispute. The effects of a ban on overtime and piecework would be catastrophic for the

rearmament and export industries, the latter including the important group of industries manufacturing railway material. A decision in favour of the ban does not seem directly to affect British Railways staff, for although many railwaymen are members of unions affiliated to the Confederation, the railway workshop staff concerned have their own negotiating procedure through the Railway Shopmen's National Council, on which both the C.S.E.U. and the National Union of Railwaymen are represented; and most railway workshop staff probably are members of the N.U.R., which is not affiliated to the C.S.E.U. Meanwhile, the Trades Union Congress, now in session at Margate, may succeed in securing acceptance of its report which is generally in favour of wages restraint. It is perhaps too much to hope that the C.S.E.U. will withdraw its claim, unjustified though it is on any grounds, not least on those of the resultant increase in the cost of engineering exports which must follow so large a wage increase for so many operatives. Arbitration by the Minister will at least give time for reflection, and perhaps also of agreement without loss of face; it is better than the disastrous course contemplated by the Confederation.

New South Wales Transport Changes

THE Government of New South Wales is to abolish the Transport & Highways Commission which it established in May, 1950, to help to secure an "efficient and properly integrated system of public transport." As we announce elsewhere in this issue, Mr. R. Winsor, Director of Transport & Highways, and a former Deputy Commissioner of Railways, becomes Commissioner of Railways in succession to the late Mr. K. A. Fraser, whose death we also record. The Premier of New South Wales, in making known the decision to disband the Commission, said that it was felt that its work of co-ordination had been largely accomplished. Other duties of the Commission were to reorganise transport services in Sydney, advise on all capital expenditure on transport, and control staff wages and relations. The Act which brought it into being also specifically subordinated the Railways Commissioner to the "control and direction of the Minister for Transport." With the end of this experiment in transport co-ordination, New South Wales will look to a new policy to grapple with the problems confronting the railways, which, faced with mounting costs, particularly wage increases, have begun to retrench on staff and capital works.

An Irish International Train

LAST Sunday the "Enterprise" express which operates between Belfast in Northern Ireland and Cork in the Irish Republic was the subject of the B.B.C. feature "Down Your Way." This train, which was inaugurated by the Great Northern Railway (Ireland), one of the few sizeable railways still operated under private enterprise in the British Isles, has always attracted a good measure of well-deserved publicity. The amenities it offers and its timekeeping are excellent features of a service which is greatly appreciated by the public. It links the ports of Belfast, Dublin and Cork, and, by its stop at Limerick Junction, provides ready access to Shannon Airport. Collinstown is only a few minutes' journey by road from Dublin and air communication at Belfast can be reached speedily. The "Enterprise" service is therefore deservedly popular with a wide variety of passengers. The B.B.C. commentator seemed a little surprised to discover that when the "Enterprise" arrived at Dublin from Belfast the train was cleaned both inside and out. It is a sad reflection on present conditions of travel in this country that what was once a common practice should have occasioned such surprised comment.

British Transport Commission Statistics

BRITISH RAILWAYS passenger receipts and passenger journey analyses are on a monthly, and the rest of the British Transport Commission statistics on a four-weekly basis. It is necessary, therefore, to reprint the British Rail-

ways passenger figures for May in No. 7 of *Transport Statistics*, which otherwise covers the four weeks to July 13. The Hotels Executive raised its restaurant car meal prices on June 9, which doubtless explains the drop in restaurant car receipts for Period 7 from £293,000 in 1951, to £254,000 this year; refreshment room takings for the period rose from £589,000 last year to £641,000. It will not be possible till next month to consider restaurant car receipts against passenger journeys in a roughly corresponding period. Trend figures show that the British Railways "operating and miscellaneous" group of grades rose steadily from 306,478 for Period 11 (roughly October) of 1951, when there were some serious deficiencies, to 313,922 for Period 7 of this year. During this last period, wastage slightly exceeded recruitment in the footplate and cleaners group, but the total numbers of guards, signalmen, and porters rose slightly. Carriage and wagon workshop staff fell very slightly during the period; because of regrouping, comparison is not possible with 1951, though it would be interesting to see how numbers were affected, if at all, by the steel shortage.

Overseas Railway Traffics

THE Canadian Pacific registered an increase of £398,667 in net earnings in July; gross earnings, at £13,063,667 were £1,132,000 more than in July, 1951. There was a decrease of £519,667 in Canadian National net revenue for the month, and of £1,999,333 for the year including July. Midland Railway of Western Australia traffics continued to show an increase; in June the increase was £9,338, making an aggregate increase for the 52 weeks of £193,202. Taltal traffics for July, the first month of a new year, were \$2,260,000, an increase of \$470,000, thus continuing the trend shown last year. Barsi Light traffics for July were £44,155, a decrease of £11,670, making the aggregate decrease for 17 weeks £29,610. In July, Peruvian Corporation traffics (excluding the Bolivian section), at \$9,506,000, increased by \$1,581,000, and those of the Costa Rica, c1,463,149, by c190,299; for both systems the four weeks are the start of the financial year.

Defence Needs Hasten New Canadian Railway

THE great defence programme in the United States, in that it is draining reserves and sources of high-grade iron ore, is focussing attention on what has been described as a "fabulously rich" deposit on the borders of Labrador and Quebec, Canada. It is over 600 miles from the nearest existing railhead at Nairn's Falls, but only about 350 miles from the St. Lawrence estuary at Seven Islands. An urgent demand therefore arose for the construction of a new railway from Seven Islands to Knob Lake on the southern fringe of the deposit. The new line, known as the Quebec, North Shore & Labrador Railway, will be between latitudes 50 and 55 north, and will rise to a summit over 2,000 ft. above sea level. Consequently extreme cold, strong winds, and heavy snow falls will limit the period of both construction and operation to the six months, May-October, in each year. This 350-mile construction, of which 94 miles are in rough country, has now been taken in hand, and is described elsewhere in this issue. All plant and labour must at present be flown inland by air, and with such a short annual working season, the line is not expected to be ready to carry the 50,000 tons of ore daily, as scheduled, before 1954.

Loan for Colombian Railway Development

THE International Bank for Reconstruction & Development has approved a loan of \$25,000,000 to Colombia. Of this sum, \$20,000,000 will go towards building a railway in the Magdalena River Valley, and the remainder will help to build and equip repair shops in Bogota. The Magdalena Valley line, 235 miles long, will provide all-rail transport between Buenaventura, on the Pacific, and the areas of Bogota and Medellin. At present traffic through the valley is water-borne, but navigation on the Magdalena River

is often interrupted in dry seasons. The loan will be used to pay for imported equipment and services needed to build the new line and the repair shops; the imported goods will be mainly structural steel, rails, work trains, constructional equipment, machinery, and tools. The bank loan is for a term of 25 years and will bear interest at the rate of 4½ per cent. per annum. The projects, whose total cost is estimated at \$49,000,000—\$25,000,000 in foreign exchange and \$24,000,000 in Colombian pesos—are part of a large railway improvement programme which Colombia is carrying out. Besides new construction and more intensive use of rolling stock, there is to be a re-administration of the national railway system, which is to become a separate corporation with independent general manager and a board of directors. There are 1,375 miles of line in Colombia operated by the Administrative Council of National Railways, with separate managements for each system; in addition there are four independent undertakings.

Signalling on the Berlin Elevated

THE jubilee this year of the opening of the first section of the elevated and underground railway in Berlin is a reminder that it was on this line that the first installation on the Continent of automatic and power signalling with train-stops, controlled by continuous a.c. track circuiting, supplied from England, was brought into use between Spittelmarkt and Nordring in July, 1913, followed in October by a section from Wittenbergplatz to Thielplatz, about 8½ miles in all. The decision to adopt this equipment had been taken on the recommendation of Dr. Gustav Kemmann, one of the company's principal advisers, who had made an exhaustive study of the working of the London underground lines and, particularly impressed by the excellent functioning of the automatic signals, perceived how beneficial it would be to introduce such methods in the German capital. It was decided to adopt all-electric, not electro-pneumatic, equipment. The adaptation of British designs to the special requirements obtaining, such as the trailability of all point machines, imposed by rigid local regulations, called for considerable care, but it was successfully effected. In due course all manual block working disappeared from the railway, and eventually light signals supplanted the original semaphores.

Kando 50-cycle Locomotives

IT is just 20 years since the first section of the Hungarian State Railways—from Budapest to Komárom—was turned over to electric traction on the Kando system, in which a phase-converter was mounted on the locomotive and 50-cycle single-phase current from the industrial network of the country converted to polyphase current at something like 1,000 volts for use in the traction motors. There was a single traction motor in the original locomotives, of 2,500 horsepower and about 10 ft. in diameter, driving through rods. This general arrangement, though suited to that power and to track speeds up to about a mile a minute, needed development if higher powers and speeds were contemplated, and also to keep abreast with technical developments in d.c. and other high-frequency a.c. systems. Eventually a frequency converter was added to the locomotive equipment to supply three-phase of different frequencies, and enable the single pole-changing traction motor to be replaced by an individual three-phase slip ring induction motor for each driving axle. The latest Hungarian locomotive development along these lines is described elsewhere in this issue.

More Co-Co Locomotives for S.N.C.F.

SINCE June this year the French National Railways have been placing in service the first units of 53 Co-Co express electric locomotives ordered for the Paris-Lyons line after experience with the two Alstom prototypes, Nos. 7001 and 7002. Of the new series, numbered 7101 to 7153, 27 are being built wholly by Alstom, while 26 are joint productions of the Compagnie Electro-

Mécanique and Fives-Lille organisations. The locomotives retain the novel pendulum type linkage between body and bogies that characterised the prototypes, and also a similar method of attachment for the Athermos axleboxes, dispensing with guides and the necessity for lubrication by the use of links carried on Silentbloc bearings. In the motors now fitted, minimum field has been reduced from 31 to 27 per cent., and the one-hour rating on full field at 1,500 V. is raised from 4,600 to 4,800 h.p. The body design follows the elegant lines of the two prototypes, with a slight modification in the interest of accessibility of the bogies. Various improvements have been made in the cab equipment, in which automatic wheel-slip warning lights are now provided. The performance of the prototypes on Paris-Toulouse services leaves no doubt that the new Co-Co series will carry on the noteworthy performances between Paris and Lyons of the present 2-Do-2 locomotives.

Turbine Locomotives

ON August 27 the rebuilt L.M.R. Pacific locomotive, *Princess Anne*, which originally was the L.M.S.R. turbine locomotive, went into regular service on the Western Division. In the lifetime of No. 46202 as a non-condensing steam turbine locomotive, the gas turbine was developed to its present pitch of being perhaps a more serious competitor with the reciprocating steam engine than the steam turbine was ever likely to be. Sir William Stanier's experiment with the "turbomotive" was fully justified, however, by the data obtained and the concrete return of some 300,000 miles of running in express service during a life of about 15 years. No doubt the relatively slow development of main-line diesel traction in this country was responsible for its long life compared with that of the post-war geared steam turbine for the Pennsylvania. This machine, like the steam-turbine-electric locomotives of the Chesapeake & Ohio, has been scrapped, but a 4,500 h.p. steam-turbine-electric with water-tube-boiler is being built for the Norfolk & Western. It is considered by the N. & W. that this method of steam-generation, coupled with electric transmission, dynamic braking, and avoidance of a separate turbine for reverse running, may combine enough advantages to ensure a future for the steam turbine locomotive in heavy goods service where at present diesels have to be operated in multiple-unit.

Operating Results in July

AT first sight an increase of 339,000 tons in freight train traffic originating might seem a satisfactory result for the four-week period to July 13, but an analysis of the figures published in No. 7 of *Transport Statistics* shows that a serious decline in merchandise forwardings is obscured by increases in mineral and coal tonnages. The decrease of 229,000 tons in merchandise recorded by British Railways brings their total loss of this high-rated traffic, during the first 28 weeks of the year, to 1,109,000 tons (3.8 per cent.). Until March, the railways held their own, but gave ground in the next four periods and would appear to have lost more merchandise traffic in the four weeks to August 10, as receipts from merchandise and live-stock were 3.3 per cent. lower in that period.

The missing merchandise would not appear to have been transferred from rail to British Road Services, for their carryings in each four-week period this year were below 1951. During the first 28 weeks, the total decrease in road carryings was 1,766,000 tons (7 per cent.). In July, a decrease of fully 12 per cent. in tonnage led to a reduction of 13 per cent. in loaded road vehicle miles. Inland Waterways also had a decrease in July of 28,000 tons (8.3 per cent.) in their originating tonnage of general merchandise. It looks as though all B.T.C. carrying activities were being hit simultaneously by a recession in some branches of trade and industry.

Another feature in the July statistics was the shortening of the average rail haul for all classes of traffic from 75.75

miles to 72.39, the lowest distance for any period since December, 1950. Concurrently, the net ton-mileage of 1,683 million was less by nearly 42.5 million (2.5 per cent.). The London Midland and Western Regions worked 4.7 per cent. and 4.3 per cent. fewer ton-miles respectively, while a fair amount of extra movement took place in the Eastern and North Eastern Regions. Freight train-miles were curtailed by 75,000 (0.7 per cent.), reductions of 67,000 in the London Midland Region and 48,000 in the Western, contrasting with increases of 18,000 in the North Eastern and 45,000 in the Scottish. Fewer freight train engine hours were worked in all Regions, except the Scottish, the saving for the whole system being 57,000 hr. (4.6 per cent.).

Coaching steam train-miles were cut also in the July period by 237,000 (1.5 per cent.) and coaching steam train engines were 23,000 less hours in traffic (2.1 per cent.). The larger part of these economies was made in the London Midland and Western Regions, where the slow movement of freight traffic throughout the winter of 1950-1951 caused much anxiety. Operating conditions in July were eased further by a decrease of 28,000 in the number of loaded wagons forwarded. This decrease of 1 per cent. had a marked effect on train working. The average train conveyed one loaded wagon less and its load dropped to 156 tons. Circumstances favoured an all-round quickening of rail transits and it is disappointing that freight train speed was no higher than 9.10 m.p.h., slightly below the June speed, though about a third of a mile above July, 1951. The general average was held down by the inability of the London Midland Region to attain a speed of more than 7.94 m.p.h. All the other Regions exceeded 9 m.p.h. and the North Eastern speed of 11.37 m.p.h. was satisfactory, because it handled more tons, worked more ton-miles and ran more freight train-miles.

During the present year, the trend of the significant measure of work done—"net ton-miles per train-hour"—has been steadily upward. The July figure, 1,172, was 23 above 1951 and 34 above 1950. The English Regions improved their output of ton-miles, the North Eastern having the highest figure, 1,499, and the Eastern raising its result by 58 to 1,306. For the first time, the London Midland Region had a better return than the Western—1,147 compared with 1,140. In the Scottish Region, the ton-mileage was almost the same as a year ago, but empty wagon mileage was 10.2 per cent. larger and 7,000 more freight train engine-hours were recorded. The effect was to decrease the net ton-miles worked in a train-hour by 35 to 971.

Loaded wagon-miles were down in all Regions, the all line decrease being 12,419,000 (4.9 per cent.). Empty wagon miles were 536,000 less (0.5 per cent.) for the whole system, though more were worked in the North Eastern and Scottish Regions. There was a slight decrease in the percentage of loaded to total wagon-miles. As in the May and June periods, wagon miles per train engine-hour numbered 238, just two more than a year ago. The Regional results varied from 290 in the North Eastern and 260 in the Eastern to 222 in the Scottish Region. The London Midland Region figure of 229 was its best effort this year and sufficed to place it for the first time in front of the Western Region, which slipped back to 224 wagon-miles in a train-hour. This relatively poor showing may be due in part to the increase of 272,000 tons (13.9 per cent.) in the Western Region coal tonnage.

The working of the electrified freight lines between Wath and Dunford Bridge failed to make good progress in July. Traffic was again light. Freight engine-miles were lower than in any period since the opening of the section, but, out of a total of 55,682 miles, "assisting not required and light running" accounted for 12,218 miles, or nearly 22 per cent. In March, only 8,003 engine-miles, or 12.6 per cent. of the total, were unproductive. Train speed dropped from 8.5 m.p.h. in May and 8.2 m.p.h. in June to 7.95. Wagon-miles worked in a train engine hour, which were 134 in May and 128 in June, declined to 126. The spare engine power apparently hampered movement. Some of it may have been used for training steam locomotive crews in electrical working. As the Manchester-Sheffield experi-

ment in main-line electrification is being watched with great interest, it would be an advantage to have a brief commentary from British Railways on the preliminary statistical results.

Bridge & Structural Engineering Congress

AS reported in *The Railway Gazette* of August 22, the fourth Congress of the International Association for Bridge & Structural Engineering has been held at Cambridge and London between August 25 and September 5. The opening session took place in the Senate House and was preceded by a congregation of the University of Cambridge at which Sir Lionel Whitby, the Vice-Chancellor, conferred Honorary Degrees of Doctors of Law on Lord Woolton, Lord President of the Council and President of the Congress; Professor Dr. F. Stussi of Zurich, President of the I.A.B.S.E.; and Professor F. Campus of Liège, Vice-President. At the opening of the Congress, Lord Woolton conveyed messages from Her Majesty the Queen and from Mr. Winston Churchill welcoming the foreign delegates to this country and wishing success to the Congress. Professor J. F. Baker, Chairman of the Cambridge Reception Committee, placed the buildings of the University Engineering Department at the disposal of the members, and the working sessions were held in one of the lecture theatres there.

The main object behind all the discussions on both theoretical and practical subjects was a seeking for economy through a better understanding of the properties and uses of structural materials. The possibility of working to higher stresses consequent on the adoption of the plastic theory was discussed, and, indeed, it was claimed that a very considerable quantity of steelwork had already been ordered for structures designed on this basis in this country.

Developments in analytical methods of dealing with the theory of elasticity and plasticity, applied statics, approximation methods, the relaxation method, and calculations regarding rupture were among the subjects discussed; but, although a better conception of the safety of structures might permit reductions in the partial factors of safety, it was none the less difficult to predict what savings might ensue in the future design of railway bridges and structures.

Dealing with metal structures, examples were given where high-grade structural steel, light metal alloys, and so on had been used. Concerning the use of welding, emphasis was laid on the importance of a conception of design based on a technique altogether different from riveting.

Under the title of the prevention of corrosion in concrete, the behaviour of concrete surfaces exposed to sulphur-laden atmosphere, marine conditions, and so on, was discussed and some methods of preventing the deterioration of concrete were put forward. A subject very much to the fore covered the uses of pre-stressed concrete, and some new methods of pre-stressing discussed came in for some criticism. Although the advantages of pre-stressed concrete are widely appreciated, there is no doubt that in this sphere much research is still necessary to make up for the lack of experience in this comparatively new medium.

The Congress Centre moved to London on Saturday, August 30, with its headquarters at the Imperial College Union in South Kensington. A reception was held at the Tate Gallery on August 30, where the party of members and their ladies, numbering in all over 600, was received by Mr. A. T. Lennox-Boyd, Minister of Transport and of Civil Aviation. In the evening of September 1, members and their ladies were entertained to a banquet at Guildhall at which Alderman Sir Frederic Michael Wells deputised for Sir Leslie Boyce, Lord Mayor of London. A number of visits arranged for members and their ladies included excursions to Oxford, to works in and around London, to North and South Wales, and to Scotland.

More than 390 members from 22 countries attended the

Congress and a wealth of valuable data was considered and exchanged not only during the working sessions but also through those informal discussions which always take place when engineers meet together outside the lecture room. It was the first time that a Congress of the I.A.B.S.E. had taken place in this country, and although it must be many years before the next Congress is held here, the contacts made through their membership of the International Association for Bridge & Structural Engineering will keep British engineers abreast of developments in this branch of the science in all parts of the world. As one of the foreign visitors said at the Closing Session in Cambridge, there can be no international barriers in the engineering profession when members meet to discuss matters which are of common interest.

Winter Timetables, Western Region

EFFECTIVE from September 15, the winter timetables of the Western Region contain practically no novelties, other than a new train at 7.45 a.m. from Oxford to Reading and Paddington, due at 9.10 a.m., and scarcely anything in the way of improvement. On the West of England main line, the 8.30 a.m. from Plymouth to Paddington is accelerated 10 min. from Exeter, and arrives at 1.30 instead of 1.40 p.m. This winter the "Cornish Riviera Express," maintaining its accelerated non-stop summer schedule of 4½ hr. between Paddington and Plymouth, will omit the Exeter call made in both directions in previous winters, owing to the improved facilities given between Exeter and Cornwall by the "Cornishman" (Birmingham-Penzance), which continues its much earlier running in both directions introduced in July last. The new summer 5 p.m. express on Sundays from Paddington to Plymouth via Westbury, due at 10.10 p.m., is also being continued throughout the winter, with its through portion for Torquay and Paignton.

On the South Wales main line, the 11.10 a.m. from Milford Haven (3 p.m. from Cardiff) is accelerated to arrive at 6 instead of 6.10 p.m., and the 12.20 p.m. from Neyland (4.20 p.m. from Cardiff) will reach Paddington at 7.50 instead of 7.55 p.m. The 4.40 p.m. from Swansea (5.55 p.m. from Cardiff) will call additionally at Reading, but the London arrival will remain unchanged at 9 p.m. as before.

On the main line to and from the North of England, the "Inter-City" (9 a.m. from Paddington to Wolverhampton and 4.25 p.m. from Wolverhampton to Paddington, 2½ hr. in each direction between Paddington and Birmingham) this winter once again will run daily except Saturdays, and not on Mondays and Fridays only, as last winter.

The 6.30 a.m. from Birkenhead to London (10 a.m. from Birmingham) is accelerated to reach Paddington at 12.15 instead of 12.25 p.m. (2¼ hr. from Birmingham), but the 12 noon and 3 p.m. from Birmingham are still allowed 2 hr. 35 min., including no less than 94 min. for the 67½ miles from Banbury to Paddington (43.1 m.p.h.), as compared with 72 min. in 1939.

A new Sunday service is provided from Paddington at 8 p.m. to Oxford and principal stations to Worcester (10.58 p.m.) and Great Malvern (11.24 p.m.); previously the latest departure from London was at 6.20 p.m. This winter the through restaurant car train between Birkenhead, Birmingham, and the south and south-east coast resorts from Brighton round to Margate once again is running daily, instead of Fridays and Saturdays only, and again with refreshment car between Birkenhead and Margate.

Among minor changes, an innovation is a train from Bristol Temple Meads at 7.15 a.m., calling at Stapleton Road, Filton, Chipping Sodbury, and Little Somerford to Swindon, where it is attached to the 9 a.m. to Paddington, arriving at 10.50 a.m. A corresponding through portion for Bristol via the Badminton line, serving the same stations, is attached to the 6.35 p.m. Cheltenham train from Paddington.

Five Years' Progress on Pakistan Railways

THE upheaval of Partition and the wear and tear of the war years gave as difficult a send-off as could be imagined for the Pakistan Railways in 1947. Partition came into effect on August 15, 1947, so that the systems have been operating with their present administrations for just five years. They consist of the North Western Railway (5,362 route-miles) and the Eastern Bengal Railway (1,696 route-miles) in West and East Pakistan respectively. Their present condition and the energetic plans being followed for their further development are a tribute to the work and foresight of Mr. F. M. Khan, who was appointed General Manager of the North Western Railway at the time of Partition and since April 17, 1950, has been Director-General of Railways in Pakistan, from which position he has now retired, as recorded on another page this week. Mr. Khan is succeeded by Mr. S. M. Hasan, formerly General Manager of the Eastern Bengal Railway.

Throughout the period from August 15, 1947, to the present time there has been a continuous increase in earnings. The accompanying and disproportionate rise in working expenses shown in the following table is due to substantial advances in wages and salaries and to higher prices of fuel and other stores:—

	Receipts Rs. (000)	Expenses Rs. (000)	Profit or loss Rs. (000)
August 15, 1947, to March, 1948	152,460	159,126	- 6,666
1948-49	351,326	317,903	+ 33,423
1949-50	343,674	328,946	+ 19,728
1950-51	381,610	368,919	+ 12,691
1951-52 (provisional)	409,330	401,794	+ 7,536

Traffic, both passenger and goods, has grown steadily. Numbers of passengers carried showed increases over 1948 of 39 per cent. in 1949, 30 per cent. in 1950, and 42 per cent. in 1951, when they totalled 127,618,506. A similar trend in goods traffic is particularly encouraging in that a decline might have been expected to result from the currency dispute with India in 1949 and a consequent drop in inter-Dominion trade. But the success of efforts to find new markets for exports and growing demand for the Dominion's raw materials were reflected in increases year by year in the numbers of wagons loaded and in ton-mileage, the figures of 1,194,864 wagons loaded and 2,904,664,465 ton-miles in 1951 being increases on 1948 of 48 per cent. and 50 per cent. respectively. Growing traffic has been accompanied by steady improvement in standards of punctuality on both railways, the present performance being on a par with the pre-war years. Both railways have been taking steps by training measures and frequent inspections to improve safety and operating efficiency. There was only one major accident involving a passenger train on the Pakistan Railways in 1951-52, that at Ghotki, North Western Railway, on June 17, 1951.

The most important motive power development has been the decision to dieselise and so render the railways independent of coal supplies. Authorisation has been given to the N.W.R. for orders for 60 diesel-electric locomotives spread over the years 1950-51, 1951-52, and 1952-53. So far the N.W.R. has ordered 23 of these locomotives for the broad-gauge system. The Eastern Bengal Railway, with 69 metre-gauge diesels authorised for 1951-52, has placed orders for 40 units.

Both railways have planned training schemes for staff concerned with diesel-electric traction. Provision has been made in the 1952-53 budget of the N.W.R. for acquiring machinery, plant, and equipment for repairs to diesel-electric locomotives. Similar measures for the E.B.R. are being studied. Old passenger rolling stock has been thoroughly reconditioned and orders have been placed for modern lightweight all-steel coaches, 122 broad gauge for the N.W.R. and 113 metre-gauge for the E.B.R. Ten of the N.W.R. vehicles will be air-conditioned. For the E.B.R., also, a further order for 45 metre-gauge coaches is in course of delivery. Orders have been placed for 1,236 goods wagons for the N.W.R. and 1,214 for the E.B.R.

An important activity on the Eastern Bengal Railway has been the development of the port of Chittagong. The railway has purchased the nucleus of a flotilla of tugs and barges which has been in operation since April, 1950, trans-

porting goods between the port and the hinterland. In the port itself, where the railway owns and operates the shore services, plans have been drawn up for developments that will meet all the requirements of the seaborne trade of East Pakistan.

Already the handling capacity at the port has been increased to over 2 million tons a year and 15 ships instead of only four at a time can be accommodated. Long-term plans already under way include construction of seven new jetties, seven transit and five export sheds, new marshalling yards, bonded warehouses, and a staff housing estate. Several schemes have been completed or are in hand for improving the capacity of some sections of the Eastern Bengal Railway. Additional crossing stations are being provided, loop lines extended, and marshalling yards at Chittagong, Akhaura, and Bhairab Bazar remodelled. Engineering and traffic surveys have been completed for about 162 miles of new lines. Since Partition over Rs.61.4 million has been sanctioned for rehabilitation of track and bridges on the two railways. It is proposed to strengthen the broad gauge main-line tracks of the N.W.R. between Karachi and Lahore and the metre-gauge main line of the E.B.R. to permit running of trains at higher speeds with diesel-electric traction.

Amenities for the travelling public have been improved continuously, notably by the provision of electric fans at stations and in rolling stock. Up to December 31 last, 541 fans had been fitted in 134 N.W.R. third class carriages. During 1952-53 it is hoped to install fans in 16 train sets of inter and third class coaches of the E.B.R. Improvements have been made in selling arrangements and quality of food at stations and in trains, and the policy of running special excursion trains at concession fares to encourage the tourist industry has been continued. A Pakistan Railways information bureau has been set up in the Hotel Metropole at Karachi.

On the railway staff side, about 4,380 permanent and 2,114 temporary quarters have been built on the E.B.R., and about 3,406 permanent quarters on the N.W.R. A staff benefit fund is maintained from which money is spent, among other purposes, on staff education and recreation. Training schemes are in operation under which staff are already studying in the United Kingdom, Canada, and the U.S.A. These measures for establishing technical proficiency and general wellbeing among the employees of the railways and their families are a sure foundation for a future in which further steady progress along the lines now being followed may be expected.

Motive Power for High Speeds

SOME significant developments are taking place today in the types of motive power on which reliance is being placed for the highest sustained speeds in passenger service. During the past fifteen years, all the fastest schedules in the world have been assigned to diesel-electric power, and since 1940 have been in the United States, but now at last, under the leadership of France, ably seconded by Italy, a strong challenge to diesel traction is being made by straight electric working over railways with the necessary line equipment. As far back as 1939, the Italian State Railways ran a three-car electric *rapido* experimentally from Florence to Milan, 195.8 miles in 115.2 min., at an average start-to-stop speed of 102 m.p.h., and with a maximum speed of 126 m.p.h.—so far as is known, the fastest run between stops that has ever been made on rails—but the war brought to an abrupt end this high-speed development in Italy. Since the war, however, recovery has been sufficiently rapid for the fastest *rapido* now to be booked from Milan to Bologna, 135.6 miles, in 114 min., at 71.1 m.p.h.

But it is in France, since the inauguration of electric working over the principal main line of the South Eastern Region of the French National Railways, between Paris and Dijon (since extended to Lyons), that the greatest strides have been made. Such timings as 152 min. for the 195.3 miles from Paris to Dijon (77.1 m.p.h. start to stop), and 155 min. in the reverse direction (73.6 m.p.h.), put well in the shade the fastest schedules ever yet tabled over the electrified New York-Philadelphia-Baltimore-Washington

main line of the Pennsylvania Railroad, U.S.A., where hitherto most of the speediest straight electric working has been found. It must be admitted, of course, that the distances between stops over the latter are much shorter than the average length of run on the Paris-Dijon route, and that the loadings of the American trains are exceedingly heavy; the "Congressional," for example, whose 70.1 m.p.h. booking over the 76.0 miles from North Philadelphia to Newark is the quickest on the service, is made up to 18 85-ft. cars of over 1,000 tons total weight.

Nevertheless, relatively to loading gauge and weight restrictions, the French 2-Do-2 electric locomotives used on the Paris-Dijon-Lyons route are hauling loads proportionately as heavy; on the two fastest trains, No. 15 down and No. 16 up, it is customary to provide a 13-coach formation weighing about 560 tons empty and 600 tons gross. We have seen details of a run on the northbound express, No. 16, on which, after a late start from Dijon, speed accelerated to 74 m.p.h. up the lengthy 1 in 125 out of Dijon, while once over the Blaisy-Bas summit, and allowing 1 min. for a slight signal check, the locomotive maintained a net average speed of 90.3 m.p.h. for 139.6 miles continuously. Unfortunately, a smoking axlebox necessitated an emergency stop at Fontainebleau, but even including a 12 min. stand while the coach concerned was being examined, the time from Dijon to Paris was only 3 min. over the 155 min. allowed. The net time for the entire run was 141 min., and the net average speed 83.0 m.p.h. throughout.

In the United States there are a few scheduled runs with diesel power at more than the maximum French figure of 77.1 m.p.h., such as the nine Chicago, Burlington and Quincy daily bookings, mostly short, at between 80.5 and 86.2 m.p.h. start to stop. However, the fastest train schedule in the world, that of the two Burlington "Twin Cities Zephyrs" over the 54.6 miles from East Dubuque to Prairie du Chien in 38 min., at 86.2 m.p.h. start to stop, could easily have been paralleled by the heavy French train whose run has just been described, seeing that an exactly corresponding distance was covered pass-to-pass in just over 36 min. Proportioning locomotive weight and

power to train weight, the nearest American parallel to the modern French timings, probably, is provided by the Union Pacific, with its three runs of Chicago-Pacific Coast "City" trains from Grand Island to North Platte, 137.2 miles in 105 min., at 78.5 m.p.h., with loads up to 1,000 tons, but hauled by triple-unit diesels of 6,000 h.p. weighing over 400 tons.

Elsewhere in this issue we include an article describing the remarkable standard of speed now obtaining in Switzerland with electric traction, notwithstanding the formidable difficulties imposed by the mountainous terrain of this small country. Details are given of runs between Lausanne and Geneva, on which diminutive Bo-Bo locomotives weighing no more than 57½ tons apiece are shown capable of averaging up to 80 m.p.h. on level track, and 75 m.p.h. up 1 in 100 gradients, with loads of over 300 tons, and all but 50 m.p.h. even up a grade as steep as 1 in 53. A considerably older 122-ton 2-Do-1 type locomotive is seen accelerating a 610-ton train from rest to 66 m.p.h. in 2 miles, and doing little more than keep time on the extremely sharp point-to-point bookings of the short runs between stops over the Simplon main line. Such fast schedules are part of the established policy of the Swiss Federal Railways, in order to obtain the maximum possible daily mileage from locomotives, rolling stock and train staffs.

But perhaps the most remarkable modern development in the electric working of fast stopping train services is found on the Paris-Le Mans main line of the Western Region, French National Railways. These also depend on extremely rapid acceleration; the passenger units now in use can attain 62 m.p.h. in 35 sec. from a start, and 93 m.p.h. in 93 sec. The maximum speed permitted normally over this route is 81 m.p.h., and this must be attained between practically all stops with such start-to-stop timings as 4.5 miles in 4 min., 5.6 miles in 5 min., 12.2 miles in 11 min., and so on. On test, one of these units has covered the 131.1 miles from Paris to Le Mans in 123 min., with no fewer than 17 intermediate stops, between the majority of which 93 m.p.h. was attained.

LETTERS TO THE EDITOR

(The Editor is not responsible for opinions of correspondents)

Groundnut Transport Problem in Nigeria

August 22

SIR,—I share Mr. D. C. Woodward's sense of resentment, expressed in his letter in your July 25 issue, at the use by *The Times* of the word "bad" when referring to the standard of locomotive management by drivers on the Nigerian Railways.

When I was General Manager, I rode frequently on the footplates of the locomotives and found no fault with their management by the African drivers. Now, 15 years later, their standard of efficiency can hardly have deteriorated with their additional experience.

The handling by these drivers of the heavy Limited and mail trains with light Pacific locomotives—having a starting T.E. at 85 per cent. b.p. of only 21,500 lb.—was always particularly creditable. I venture to believe that a driver from British Railways would find that task no sinecure.

As Mr. Woodward points out, the railways of Equatorial Africa are not sections of British Railways. The ancestral village background of the African stationmasters, locomotive and train crews, workshop artisans, draughtsmen and so forth has to be remembered.

I am sure that the managers of the West and East African railways, and those of the railways of the Congo, will agree with me when I say that the standards of mechanical technique already attained by native African staff dispel for

all time the notion that these men cannot be trained to do good, responsible work.

Yours faithfully,

G. V. O. BULKELEY

Botha's Hill, Natal, South Africa

Fares Revision

August 29

SIR,—In your first leader of August 22, you stated that a loss of transport revenue of £1,900,000 is a heavy price to pay for Government intervention. Surely the situation was that the country as a whole felt that the comparatively small subsidy of £2,000,000 for its transport was quite as well spent, if not better, than on other subsidised industries.

Transport's importance in the national economy, touching as it does every phase of the national life, may very well make it wise, if not imperative, for Parliament to modify the policy whereby the Commission is expected to make transport pay. It is only Parliament who can take steps similar to those taken by the French Government recently, described in your issue of August 15, in subsidising transport in the nation's interest.

C. GRASEMANN

52, Hurlingham Court, S.W.6

[The loss of revenue did not involve any element of subsidy.—ED., R.G.]

THE SCRAP HEAP

Dangerous Speed

The Victorians were much given to saying that railway travel had "annihilated distance." If the claim was greatly exaggerated, the Victorians were at least untroubled by the thought that distance was not the only thing that could be annihilated by speed. It is not easy for us to ignore the fact that the Canberra is a bomber.—From "The Daily Telegraph."

Obstruction Danger

Two Poplar boys appeared at East London Juvenile Court recently charged with putting an old kettle on the railway line between Dalston and Poplar in the path of an oncoming train. As the train approached, the younger boy took the kettle off the line, but the elder put it back again. The train was brought to a standstill only a few inches from them.

Bringing up Father

There was a time when Dad could take Junior down to the trains and without too much difficulty explain what happens inside a steam locomotive. Times, however, have changed. The new triple-unit diesel locomotive has captured Junior's fancy and unless today's Dad is a trained technician he is at a loss to explain what makes it tick.—From an article, "How the Diesel Does It," in the "Canadian National Magazine."

Value for Money

The Thetford Station bookstall employee, whose aim to break his own record of travelling 3,431 miles in two weeks with a "runabout" ticket was mentioned in our August 15 issue, has bettered his previous performance by 624 miles. This year his fortnight of travel on a £2 ticket totalled 4,055 miles.

Rush Hour

A correspondent writes that the account, in The Scrap Heap, July 25 issue, of a blunder at an East African Railways crossing station, reminds him of a similar occurrence on the Iraqi State Railways.

A stationmaster's error at a small desert crossing station in allowing an incoming goods train to enter the loop—already occupied—was reported by him as caused by his pointsman's "sudden confusion owing to rush of trains."

Out of the Window

In summer the game-players seem to spend their time in teasing and torturing their fellow citizens who want to watch them out of the train window. The passenger on a Saturday afternoon is buoyed up through a series of stoppages at small drowsy stations by the hope of a cricket match . . . but no honest traveller can declare that he has ever seen "a sixer climb the sky," or a wicket sent spinning like a catherine wheel, or a towering catch held just as

the train whirls or crawls out of range. . . . Yet if the cricketers are maddening the golfers are far worse. . . . The player may encourage false hopes by addressing the ball, but his waggle is so prolonged and ornate that though the passenger crane his neck the actual stroke always escapes him. Worse still, there are those who deliberately refrain from playing until the train has passed under some nonsensical apprehension of being "put off."—From "The Times."

Brussels-Antwerp, 1836

At six o'clock exactly the guard's horn gave the signal. The train started slowly, then gradually worked up to a breathtaking speed. If this mode of travel has any drawback, it is that of being too fast.—From a traveller's letter of 1836, describing a journey from Brussels to Antwerp, quoted in "Trains."

Lock-omotion

A correspondent sends details of a remarkable head-on collision on the Chicago Great Western Railway near Ingaltion, Illinois. The two trains involved were both heavy freight trains, hauled by 2-10-4 locomotives, the principal freight type of the railway. The eastbound train, behind locomotive No. 868, ran into the westbound train, headed by No. 864, and the force of the impact wedged the two locomotives tightly together, forcing the ten coupled wheels of No. 868 a foot above the rails, but leaving the four-wheel trailing truck on the rails.

So securely were the engines locked that the breakdown crew was unable to separate them, and it was decided to tow the two locked engines to Ingaltion yards, some three miles distant, where they could be prised apart and then hauled to the locomotive shops at Oelwein, Iowa. Accordingly, the two

trains of freight wagons were detached, and the engines were thus hauled, No. 868 riding on the trailer truck only, with the pony truck and ten coupled driving wheels clear above the rails.

The Ticket Collector

A seagull snatched a boat ticket from the handbag of a week-end passenger in a steamship at Holyhead and dropped it on another part of the vessel.

Inspecting the Engine

We observe that Prince Charles and Princess Anne have reached the age when the inspection of the engine is mandatory before an overnight journey. Since both their mother and their father are old hands at driving locomotives they have a family as well as a prescriptive interest in engines.

We imagine that the little Prince may have discussed the engine later on in the journey with his father. He and his sister carried out their visit with their nurses, and few nurses are able to talk with either insight or authority about engines. The average nurse, we believe, has no inherent respect for a locomotive and what attention she may pay to one is largely dutiful.

Many fathers, if it comes to the point, pretend that they are not impressed by express engines. They do, however, when time permits, generally make a point of escorting their offspring to the engine of the train. They adopt an elaborately casual attitude while standing in front of the cab and smoke their pipes in an indulgent fashion. This is largely a pose. The old desire to drive an engine may have been smothered under less innocent ambitions, but respect for a handsome engine can never entirely vanish. The visit to the engine is a pilgrimage of courtesy as well as of respect, because it is a civil thing to salute the driver of one's train.—From "The Scotsman."



Photo.]

[Frank Hayworth, Jr.

The locked 2-10-4 locomotives after the collision between two heavy freight trains on the Chicago Great Western Railway

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Orange Free State Goldfields Traffic

To cope with the increase in traffic between the Orange Free State and Natal resulting from the development of the Orange Free State goldfields, the railways will embark in the next few years on schemes to improve facilities and working conditions between Kroonstad and Natal.

One of the major improvements for speeding up traffic will be the doubling of the main line from Pietermaritzburg to Danskraal, at an estimated cost of nearly £6,300,000. Two sections of three miles each, from Tweedie to Lion's River, and Dargle to Lidgetton, have already been opened. On the four-mile section between Nottingham Road and Rosetta, the earthworks and 80 per cent. of the trackwork have been completed. A twin tunnel, about 900 ft. long, between Estcourt and Ennersdale, and the earthworks on the eight-mile stretch between these stations, are in advanced state of construction.

At Kroonstad, Orange Free State, a new unmechanised hump marshalling yard is to be laid out to handle the increasing traffic, and connections from the main line to it are being put in. The tonnage of goods passing through Kroonstad increased from 16,566,957 in 1949 to 17,313,207 in 1951.

On the extension of the Whites-Odenaalsrus line to Allanridge in the O.F.S. goldfields, 5½ miles of track have already been laid, and it is expected that the entire line, some nine miles long, will be opened to traffic towards the end of this year. The total estimated cost of the new line is £369,146, and the Anglo-American Corporation, at whose request the new line is being built, have guaranteed the railway administration against working losses on the line.

RHODESIA

Staff Recruitment

The administration recently sent a senior officer to Europe to recruit staff in the grades of firemen, shunters, and guards. As a result, 35 Italians recently arrived in Southern Rhodesia by air, and were followed by a batch of recruits from the Netherlands.

UNITED STATES

Possible Frisco-Central Georgia Fusion

Approaches are being made by the St. Louis-San Francisco Railway, generally known as the Frisco, to obtain control of the Central of Georgia Railway, which occupies an important strategic position in the south-eastern States. Hitherto the Central of Georgia has been operated independently, but as a subsidiary of the Illinois Central system. Contact between the Frisco and the Central

of Georgia is made at the important steelmaking centre of Birmingham, Alabama, and the enlarged system would therefore have its own trackage throughout from St. Louis, Kansas City, Oklahoma City, and Tulsa to the Atlantic coast at Savannah, Georgia. This would supplement the direct access already obtained by the San Louis-San Francisco to the Gulf of Mexico at Mobile by its acquisition in 1948 of the 214-mile Alabama, Tennessee & Northern.

The St. Louis-San Francisco has a total route mileage of 4,925; its two principal main lines, which intersect at Springfield, Missouri, extend south-westwards from St. Louis to Tulsa, Oklahoma City, and Dallas, Texas, and from Kansas City to Memphis and Birmingham. The Central of Georgia has its centre at Macon, Georgia, from which radiate lines to Atlanta, Savannah, Columbus, Birmingham, Montgomery, and Albany, the last-named on an important through route to Florida. The Central of Georgia has a route mileage of 1,816.

The St. Louis-San Francisco also has close relationships with the Missouri-Kansas-Texas, and works its principal trains, such as the streamlined "Texas Special," for the first 361 miles from St. Louis to Vinita, where it intersects the M.K.T. main line.

ARGENTINA

Winter Services

The winter timetables of the General Mitre Railway include a recasting of the Tucumán and Santiago services, which consist of the air-conditioned "El Tucumán" twice weekly with a relief train once weekly. A semi-fast train runs daily to Santiago and five times a week to Tucumán. The sleeping car express "Estrella del Norte" runs twice weekly and the fast "El Santiagueño" once weekly. To Córdoba there is the day express "El Serrano" three times a week and the night express "Rayo de Sol" six times a week, as well as a daily stopping train.

Rosario has three daily expresses, "El Porteño," "El Rosarino," and "El Santafesino," with an extra service by the Tucumán semi-fast train five times a week. There is also a daily stopping train and a weekend express. To Santa Fe there are a diesel train connection daily with the Buenos Aires-Rosario expresses, and a sleeping car train six times a week. On the Rio Cuarto service there are three day trains and the diesel train "El Gaucho" each week *via* Venado Tuerto and the same number *via* Firmat. Between Rosario and Bahía Blanca there are two sleeping car trains a week. On the Buenos Aires suburban section, the shuttle service between Borges and Delta has been restored.

On the General Urquiza Railway, the combined river-rail service *via* Puerto Uruguay runs three times weekly to Posadas, Corrientes, and Concordia, and once a week to Asunción (Paraguay). "El Entrerriano" to Concordia runs three times a week, using the ferry service from Zárate to Ibicuy.

Particulars of the winter timetables on other lines were given in our August 29 issue.

FRANCE

Crystallised Sugar in Hopper Wagons

The Western Region of the S.N.C.F. and a sugar refining company have been experimenting with the conveyance of crystallised sugar from Cagny (Calvados) to Riviére-Thibouville (Eure) in automatic emptying hopper wagons. The wagons used were sixteen of the 190 hopper-bottom wagons used by the Western Region for the conveyance of its own coal traffic; they are two-axle wagons of 20-tonne capacity with tare weight of 11 tonnes. For the conveyance of crystallised sugar, the wagons were slightly modified. The bottom doors were lined with rubber to ensure that there was no leakage and the riveted joints between the plates were strip-welded for additional protection. A light tubular structure was erected over each wagon to enable a tarpaulin to be put over the load.

Loading Rails by Transporter

At the depot at Lalluque large quantities of 72-ft. rails have to be loaded on wagons. Until recently, it was necessary to employ a gang of 22 men on this work. The depot staff has now adapted a discarded wagon transporter, which was mechanically sound, for this work. The cabin part of the transporter has been mounted on a wagon, and a petrol motor operates the transporter winch, which moves the transporter cables. The installation is placed against the wagon to be loaded, and the cables from the winch are let out over the sides of the wagon and attached to the rails by two hooks. The rails are hauled up to the floor of the wagon over slide bars.

WESTERN GERMANY

Reduced Federal Railways Receipts

The financial situation of the Federal Railways was stated recently to be causing concern, there being no alternative to retrenchment in maintenance and renewals. The 1952 budget was based on receipts of DM. 5,150 million. In the first three months of this year receipts were satisfactory; but since April an adverse trend has set in. Receipts during the second quarter of 1951 were some 5 per cent. higher than in the first, whereas this year receipts during the second were 2.6 per cent. lower than in the first quarter.

Full versus Partial Throttle—2*

Effects of the two methods of coal consumption and mechanical efficiency

By E. C. Poultney, O.B.E., M.Inst.Loco.E.

HOW the combined effect of speed and rate of cut-off may be expected to influence coal consumption will now receive attention. In this case, boiler performance as measured by the steam produced per unit quantity of coal fired is an important factor. In all instances, any increase in the rate of evaporation reduces the water evaporated in pounds for each pound weight of coal fired. Conversely, a lower steam demand improves the water/coal ratio and the boiler efficiency per cent. From this it will be seen that, as a short cut-off at any speed (r.p.m.) causes the least steam demand, the resulting lower rate of firing will increase the efficiency of the boiler.

On the other hand, the lower demand for steam reduces the temperature of the steam and the amount of superheat which, as already mentioned, adversely affects cylinder efficiency, especially at short cut-offs and at the higher rates of expansion in combination with low speeds in revolutions per minute. It follows, therefore, that for a short cut-off to show a minimum coal rate per cylinder h.p., the speed in r.p.m. must be sufficient to produce a rate of evaporation which will, in turn, produce the amount of superheat required to counteract cylinder wall losses sufficiently so that losses in cylinder efficiency will not, in turn, counteract the effect of the increased water/coal ratios ruling at the lower rates of evaporation.

Though short cut-offs will be associated with minimum coal rates per cylinder h.p., the cut-off at which this takes place will depend upon speed and for any given speed in r.p.m. the best point of cut-off will depend upon the combined effect of steam temperatures and the boiler evaporative efficiency. The former affects cylinder efficiency and the latter the amount of water evaporated and steam produced per unit quantity of coal fired.

Mechanical Efficiencies

The performance of the cylinders, as influenced by the quality of the steam supplied and the effect this has on the evaporative efficiency of the boiler having been considered, the effect of cut-off on the mechanical efficiency now requires attention. The importance of this lies in the fact that, when the steam to the engines is reduced in pressure by throttling, the rate of cut-off must be advanced if equal powers are required when compared with those developed with high pressure steam in association with relatively short cut-offs.

From the point of view of mechanical efficiency, an examination of the performance of any locomotive shows that

cut-off has a very decided effect on the friction h.p. at a given speed in revs. per min. At any speed in r.p.m., the friction h.p., meaning the power absorbed by the mechanical parts of the engines, diminishes as the rate of cut-off is lengthened and at any cut-off the friction h.p. increases with an increase in speed. In order to indicate how variations in speed and cut-off may be expected to influence mechanical efficiency per cent., the accompanying graph (Fig. 3) has been prepared.

Two curves are plotted relating to

crankpins through the inertia effects of the moving parts, thus tending to improve mechanical efficiencies at high speeds relatively to those shown at lower speeds.

Coal and Water Rates

The consumption of fuel and water per dynamometer h.p.-hour will be governed by the amount of the total power developed, that is, absorbed by the engines. In other words, the mechanical efficiency will be a factor controlling the fuel and water rates.

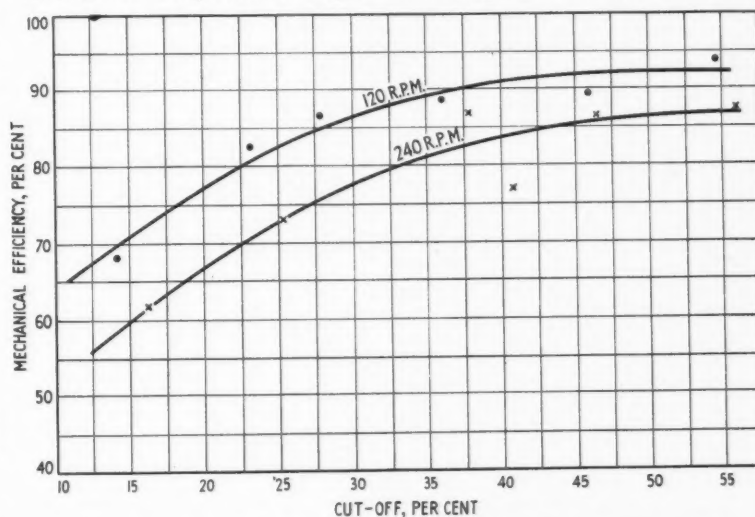


Fig. 3—Graph indicating mechanical efficiency at different speeds plotted against cut-off

two different speeds in r.p.m. and show how for each speed the mechanical efficiency is related to the cut-off per cent. In each case there is a very decided increase in efficiency as the cut-off is lengthened, while at the higher speed, 240 r.p.m., the mechanical efficiency is appreciably lower than at the lower speed of 120 r.p.m.

An interesting fact brought out by the graph is that at low powers the mechanical efficiency is least, while, the greater the powers developed in the cylinders, the higher is the mechanical efficiency, meaning that the available power at the rim of the driving wheels is augmented, becoming a larger percentage of that indicated in the cylinders. In view of the fact that the highest mechanical efficiencies are associated with late rates of cut-off, it would seem that low efficiencies at early cut-offs are due to the considerable differences then present between maximum and mean piston loadings.

If such is the case, it may be assumed that any increase in speed will tend to decrease this inequality of loading on

Lengthening the rate of cut-off improves the mechanical efficiency; thus, any loss in economy due to throttling and extending the rate of cut-off will tend to be offset to some extent by the lower frictional h.p. absorbed by the engines, because for given hourly rates of firing and evaporation the available power will be increased by the amount that the friction h.p. is reduced.

It will be realised from the foregoing discussion that the actual effect of throttling on the fuel required per h.p. developed at the drawbar is governed by the cylinder efficiency, as shown by the steam required per i.h.p.-hour, the efficiency of the boiler and the superheater and the loss in power output due to frictional h.p., the net result being, therefore, dependent upon the interplay between the various processes employed in producing the power shown by the dynamometer. For a given h.p., throttling reduces cylinder efficiency, due to a decrease in the range of expansion of the steam. This increases the steam required, which reduces boiler efficiency, but assists cylinder efficiency by increas-

* Part I appeared in our issue of August 29

ing the superheat in the cylinder feed. The lengthened rate of cut-off tends to promote mechanical efficiency. The evaporation rate per unit weight of coal fired is probably important, but how much this will affect the fuel rate per h.p. developed will largely depend upon the rate at which the water/coal ratio deteriorates as the rate of firing advances.

Experimental Data

The experimental results obtained by throttling tests known to the writer re-

The class "E6s" Atlantic type locomotive was the subject of a very complete series of tests on the plant at Altoona, during the course of which two trials were made at each of the speeds 200, 240 and 280 r.p.m. at cut-offs of 30 and 40 per cent., the throttle opening being adjusted to obtain substantially the same dynamometer h.p. as obtained with a fully open throttle at the same speeds but at 20 per cent. cut-off. The results are given by Tables 2 and 3, which are based on the original test data, but are rearranged to include

is very closely equal for the full throttle and partial tests, the difference being only about 2 per cent. In order to assist in an analysis of the results, particulars of the water/coal ratios have been added; also the mechanical and cylinder efficiencies. The latter are based on the heat utilised per lb. of steam computed from the steam rates per i.h.p.-hour and the total heat in the steam B.Th.U. above 32° F.

Referring to the cylinder performance when working with a full regulator opening and at a cut-off of 20 per cent.,

TABLE 2—CYLINDER PERFORMANCE. "E6s" 4-4-2

Test conditions		Boiler pressure, p.s.i.	Branch pipe pressure, p.s.i.	Branch pipe steam temp., °F.	Branch pipe steam superheat, °F.	B.Th.U. in steam	I.H.P.	Mean effective pressure, p.s.i.	Steam per I.H.P. hr., lb.	B.Th.U. utilised per lb. of steam	Cylinder efficiency per cent.
r.p.m.	Partial Throttle Cut-off, per cent.										
200	30	202.1	140	550.5	190.4	1,299	1,139	58.0	19.21	132.5	10.1
200	40	203.4	115	577.7	224.9	1,317	1,154	59.2	19.64	129.5	9.8
240	30	204.9	172.4	567.1	211.0	1,316	1,606	69.0	17.92	142.0	10.8
240	40	203.9	142.4	606.1	243.2	1,326	1,664	71.2	19.06	133.4	10.01
280	30	203.6	162.4	601.4	229.8	1,327	1,700	62.2	17.6	148.0	11.1
280	40	204.9	126.9	608.6	255.0	1,330	1,610	59.2	19.32	138.5	10.4
	Full Throttle										
200	20	202.5	196.7	563.9	177.6	1,298	1,228	63.37	17.41	146.1	11.25
240	20	205.0	199.6	577.1	189.8	1,304	1,424	61.2	16.43	154.8	11.85
280	20	204.0	196.2	584.0	197.9	1,308	1,544	57.3	16.24	156.5	11.95

TABLE 3—LOCOMOTIVE PERFORMANCE. "E6s" 4-4-2

Test conditions		Steam to engines, lb. per hr.	I.H.P.	Steam per I.H.P. per lb.	Coal per I.H.P. per lb.	D.B.H.P.	Steam per D.B.H.P. hr. lb.	Coal per D.B.H.P. hr. lb.	Mech. efficiency, per cent.	Water lb. evap. per lb. of coal fired
r.p.m.	Partial Throttle Cut-off per cent.									
200	30	20,756	1,139	19.21	2.22	876	23.69	2.89	76.8	8.65
200	40	22,690	1,154	19.64	2.30	886	25.59	2.99	76.8	8.55
240	30	28,781	1,606	17.92	2.26	1,119	25.79	3.25	69.7	7.92
240	40	31,561	1,664	19.06	2.57	1,125	28.04	3.78	67.9	7.40
280	30	29,179	1,700	17.16	2.21	1,065	27.39	3.53	62.6	7.74
280	40	31,111	1,610	19.32	2.59	1,095	28.38	3.81	68.0	7.45
	Full Throttle									
200	20	21,393	1,228	17.41	2.22	871	24.56	3.14	70.8	7.86
240	20	23,395	1,424	16.43	2.07	1,136	20.59	2.59	79.7	8.05
280	20	25,232	1,544	16.24	1.99	1,085	23.24	2.85	69.8	8.16

Test carried out with injector feed and hand fired

late to trials made with the following locomotives:—

Tables 2 and 3.—Tests of a class "E6s" passenger locomotive (*Pennsylvania Test Bulletin No. 21*) Atlantic type locomotive; two cylinders, 22 in. by 26 in.; boiler pressure, 205 lb. per sq. in.; driving wheels, 80 in. dia.

Tables 4 and 5.—Tests of a class "I1s" freight locomotive (*Pennsylvania Test Bulletin No. 32*) 2-10-0 type locomotive; two cylinders, 30½ in. by 32 in.; boiler pressure, 250 lb. per sq. in.; driving wheels, 62 in. dia.; limited cut-off, 50 per cent.

Tables 6 and 7.—(*Baldwin Locomotive Works Bulletin*, 1926), locomotive No. 60000 experimental three-cylinder compound locomotive for freight service; 4-10-2 type; cylinders, h.p. (1), 27 in. by 32 in.; l.p. (2), 27 in. by 32 in.; boiler pressure, 350 lb. per sq. in.; driving wheels, 63½ in. dia.

certain additional information.

This has been done in order to permit of the results being considered in relation to the foregoing discussion. The tables relate to the cylinder performance and to the overall performance of the locomotive. The tabulated data for the other two locomotives have been drawn up as far as possible in the same manner.

With reference to the full throttle tests, it will be noted that the coal and water consumptions at 200 revs. per min. and 20 per cent. cut-off were both higher than those shown for the same cut-off and at the higher speeds of 240 and 280 revs. per min. when the branch pipe steam carried a higher superheat, due to the evaporation increasing from 21,393 to 23,395 and 25,232 lb. per hr., as measured by the steam supplied to the engines.

The enthalpy of the steamchest steam

it will be noted that at 200 r.p.m. per min. the steam rate per i.h.p.-hour was 17.41 lb., whereas at 280 r.p.m. it fell to 16.24 lb. per i.h.p.-hour. At the former speed, the steam carried a superheat of 177.6° F., while at the latter, the superheat increased to 197.9° F., thus clearly showing the influence of superheat on steam consumption. Further, on the basis of cylinder h.p., the coal required per i.h.p.-hour at 200 r.p.m. was 2.22 lb., while at 280 r.p.m. it was only 1.99 lb. per i.h.p.-hour.

The rather low evaporation per lb. of coal fired, shown for this particular test, would account to some extent for the higher coal rates, though, if the water evaporated per lb. of coal had been, as might have been expected, rather more, say 8 lb. at the lower evaporation of 21,393 lb. per hour based on the cylinder feed, the coal per i.h.p.-hour would still have been 2.18 lb. as against less than

TABLE 4—CYLINDER PERFORMANCE. "I.I.s" 2-10-0

Test conditions	Boiler steam pressure, p.s.i.	Branch pipe pressure, p.s.i.	Branch pipe steam temp., °F.	Branch pipe steam superheat, °F.	B.Th.U. in steam	I.H.P.	Mean effective pressure, p.s.i.	Steam per I.H.P. hr. lb.	B.Th.U. utilised per lb. of steam	Cylinder efficiency, per cent.
r.p.m.										
Partial Throttle										
Cut-off, per cent.										
40	248	134	564	206.6	1,300	1,168	63.4	19.74	128.8	9.9
40	248	136	548	189.4	1,292	1,186	64.4	19.02	133.3	10.3
55	248	96	574	239.2	1,310	1,132	61.4	20.63	123.0	9.4
Full Throttle										
20	247	243	559	155.8	1,290	1,191	64.7	19.17	132.7	10.3
20	248	242	555	152.8	1,289	1,188	64.6	18.57	137.0	10.6

Limited cut-off (nominal 50 per cent.). The actual maximum cut-off is 55 per cent.

TABLE 5—LOCOMOTIVE PERFORMANCE. "I.I.s" 2-10-0

Test conditions	Steam to engines, lb. per hr.	I.H.P.	Steam per I.H.P. hr. lb.	D.B.H.P.	Steam per D.B.H.P. hr. lb.	Mechanical efficiency, per cent.
r.p.m.						
Partial Throttle						
Cut-off, per cent.						
40	23,052	1,168	19.74	1,037	22.2	89
40	22,566	1,186	19.02	1,037	21.7	87
55	23,340	1,132	20.63	1,006	23.21	89
Full Throttle						
20	22,822	1,191	19.17	1,004	22.81	84
20	22,070	1,188	18.57	1,001	21.99	84

Test carried out with injector feed and stoker fired

2 lb. at the higher speed. It seems clear, therefore, that superheat and speed combined have a very definite influence on cylinder efficiency and that it cannot be said without certain qualifications that short cut-offs are the most economical, either from the point of view of fuel or steam consumptions per i.h.p.-hour.

Comparing the coal consumptions per dynamometer h.p. before and after throttling, the loss in efficiency due to the latter is apparent. For instance, take the tests at 240 r.p.m., the coal rate per d.b.h.p.-hour at 20 per cent. cut-off and full throttle is 2.59 lb., while at 30 per cent. cut-off and a partial throttle opening this is increased to 3.25 lb., a difference of 0.66 lb., or 25 per cent., and, if the cut-off is further lengthened to 40 per cent. at the same speed, the coal rate becomes 3.78 lb., thus increasing the loss in efficiency to 46 per cent. An interesting point brought out by the experimental data is the close similarity in the steam pipe

steam enthalpy or heat content B.Th.U. per lb. before and after throttling at equal speeds in r.p.m., which is theoretically correct.

2-10-0 Freight Locomotive

Tables 4 and 5 relate to tests made with the 2-10-0 freight engine. These were made at a low speed of only 80 r.p.m. This locomotive was fitted with an open type feedwater heater, but the data given refer to tests made when the injector only was used. Coal consumptions were not recorded. The superheat carried by the steam in the branch pipes leading to the steamchests was appreciably higher when the steam was throttled than when the throttle was full open; also, when running with the throttle only partially open and the cut-off lengthened, the mechanical efficiency was improved with the result that steam rates per drawbar h.p., though slightly higher when the steam is throttled, are not greatly different.

The mean steam rate per i.h.p.-hour

is 18.87 lb. for the two full-throttle tests at 80 r.p.m., and 20 per cent. cut-off, and at the same speed but 40 per cent. cut-off the steam rate is 19.38 lb. per i.h.p.-hour, a difference of 2.6 per cent. On the basis of the powers developed at the drawbar, the steam rates are 22.4 lb. and 21.9. There is thus, in this particular case, slightly less steam used per drawbar h.p. when using a partially opened throttle, brought about by an increase in the mechanical efficiency by the use of a longer rate of cut-off.

4-10-2 Compound Locomotive

The partial and full throttle tests made with the Baldwin compound locomotive comprised five trials at speeds of 80, 120, 160 and 200 revs. per min. respectively. Particulars are given by Tables 6 and 7. This locomotive showed remarkably low coal and steam rates, both on the basis of the cylinder and drawbar h.p. and a decided economy when operated with a fully opened throttle

TABLE 6—CYLINDER PERFORMANCE. 3-CYL. COMPOUND, 4-10-2

Test conditions	Boiler steam pressure, p.s.i.	Branch pipe pressure, p.s.i.	Branch pipe steam temp., °F.	Branch pipe steam superheat, °F.	B.Th.U. in steam	I.h.p.	Steam per i.h.p.-hr. lb.	B.Th.U. utilised per lb. of steam	Cylinder efficiency, per cent.
r.p.m.									
Partial Throttle									
Cut-off, per cent.									
70/40	346	253	550	143	1,290	1,400	16.2	157	12.23
90/70	349	254	607	200	1,317	2,018	16.8	151	11.44
80/50	349	217	599	205	1,314	2,188	15.0	169.5	12.89
70/40	350	196	565	181	1,302	1,781	15.3	166.3	12.73
80/50	348	202	614	260	1,325	2,739	15.4	165.1	12.42
Full Throttle									
50/20	347	339	568	135	1,289	1,471	14.9	170.5	13.2
70/40	349	337	600	168	1,309	2,164	14.8	172.0	13.19
60/30	349	335	615	183	1,317	2,333	14.3	178.0	13.52
50/20	349	339	613	180	1,315	1,986	14.8	174.0	13.21
60/30	346	327	651	222	1,338	2,880	15.3	166.2	12.42

TABLE 7—LOCOMOTIVE PERFORMANCE. 3-CYL. COMPOUND 4-10-2

Test conditions		Steam to engines lb. per hr.	I.H.P.	Steam per I.H.P. hr. lb.	Coal per I.H.P. hr. lb.	D.B.H.P.	Steam per D.B.H.P. hr. lb.	Coal per D.B.H.P. hr. lb.	Mechanical efficiency, per cent.	Water, lb. evap. per lb. of coal fired
r.p.m.	Partial Throttle Cut-off per cent.									
	80	70/40	22,612	1,400	16.2	2.1	1,068	21.8	76.3	7.8
	80	90/70	33,994	2,018	16.8	2.1	1,758	19.8	87.1	7.95
	120	80/50	32,854	2,188	15.0	1.9	1,801	18.6	82.3	7.75
	160	70/40	27,307	1,781	15.3	2.0	1,281	21.8	71.9	7.5
	200	80/50	42,092	2,739	15.4	2.1	2,066	20.7	75.4	7.4
r.p.m.	Full Throttle									
	80	50/20	21,882	1,471	14.9	1.8	1,099	20.4	74.7	7.75
	120	70/40	32,003	2,164	14.8	1.9	1,289	18.2	82.7	7.60
	160	60/30	33,453	2,333	14.3	1.9	1,801	18.8	77.5	7.85
	200	50/20	29,339	1,986	14.8	1.8	1,308	22.9	65.9	8.19
		60/30	44,147	2,880	15.3	2.1	1,954	23.1	67.8	7.21

Tests carried out with feed water heater and stoker-fired

compared with the partial throttle tests. When running under the latter conditions, it will be noted that mechanical efficiencies were distinctly higher, due to the longer cut-offs used to obtain closely equal powers at the drawbar.

Comparing the performance of the compound with the simple expansion engine class "E6s" an interesting point brought out is the fact that, whereas the latter at the lowest cylinder h.p. had a higher steam rate per i.h.p.-hour, the compound, on the other hand, showed substantially the same steam rates for all powers in the case of the full throttle tests. The compound, when operating at minimum power at 80 r.p.m. with a high-pressure cut-off of 50 per cent. and for the low-pressure cylinders 20 per cent., showed a water rate of 14.9 lb. per i.h.p.-hour and, at the same cut-offs and at 160 r.p.m., 14.8 lb. per i.h.p.-hour, the superheat carried by the steam

being 135° and 180° F. In this case, the lower superheat did not affect the cylinder efficiency to the same extent as was noted with the simple expansion engine, due to the longer cut-off in the high-pressure cylinders with, in consequence, reduced cylinder wall losses.

At the earliest rates of cut-off and at the low speed of only 80 r.p.m., the heat utilised per lb. of steam per i.h.p.-hour was 170.5 B.Th.U., and for the simple expansion engines "E6s" at 200 r.p.m. and 20 per cent. cut-off, only 146.1 B.Th.U. per lb. of steam per i.h.p.-hour was utilised, although the superheat carried by each lb. of steam was 177.6° F. as against but 135° F. in the case of the compound. The much longer rate of admission in the high-pressure cylinder of the compound engine, and compound expansion reducing cylinder wall effects, produced a highly economical locomotive, so pointing to the large

economies attainable with compound as against simple expansion cylinders.

The increase in the coal consumption per drawbar h.p.-hour in the case of the compound engine, caused by throttling, is seen to be relatively small, ranging between 3.6 and 7.7 per cent. On the basis of the cylinder h.p. the steam rates are greater, ranging from about 13 per cent. to only 0.6 per cent. For the simple expansion engine "E6s" the steam rate per i.h.p.-hour showed a maximum increase of about 19 per cent. at 280 revs. per min. when the full throttle and partial water rates were respectively 16.24 and 19.32 lb. per i.h.p.-hour. These notes on the performance of the three locomotives concerned can be supplemented by further study of the experimental data, which no doubt would provide interesting information.

(Concluded)

HEADLIGHTS SUGGESTED FOR UNDERGROUND TRAINS.—After hearing how a signal linesman was killed by a London Transport train whilst working at an inspection box on open track near East Finchley, the coroner at a Hendon inquest suggested that headlights be fitted on Underground multiple-unit stock to enable motormen to see men working on the line and to help them generally in tunnels.

ALUMINIUM PRICE REDUCTIONS.—The British Aluminium Co. Ltd. announces price reductions, amounting to 2d. a pound or nearly 8 per cent. for bulk quantities, for the special range of thin gauge sheet and coiled strip for boxmaking and capping purposes. These reductions came into effect on September 1 and follow completion of substantial extensions to the company's Falkirk rolling mills including the installation of new high-speed tandem and finishing strip mills specially designed for the economic production of this class of material.

ASH AND CLINKER IN INDUSTRY.—A special study of ash and clinker in industry will be the subject of a conference organised by the Institute of Fuel, to be held at the Institution of Mechanical Engineers on October 28 and 29. Problems of practical interest to industrialists which will be discussed include the treatment and disposal of ash and clinker, problems of deposits

and corrosion, and the influence of ash on boiler design. The quantitative effect on boiler efficiency will also be considered, and available methods of evaluating coals of varying ash content will be discussed at the conference.

SPECIAL TRAINS FOR TERRITORIALS.—Special trains from Middlesbrough, Harrogate, York, Hull, and Leeds Central, were arranged by the North Eastern Region last weekend for Territorials going to camp at Towyn (North Wales). The Middlesbrough, Harrogate, and York portions were combined at Leeds City.

BYRCE-BERGER AMALGAMATION.—Manufacture of the Berger Handraulic starter will in future be concentrated in the Ironbarks Works of Bryce Fuel Injection Limited at Staines. The Bryce and Berger concerns have been amalgamated under the title of Bryce-Berger Limited, the Directors being Mr. Miles Beavor (Chairman), Mr. I. T. Morrow (Deputy Chairman), Mr. S. Webster (Managing), Mr. J. E. Markes (Sales), and Mr. W. A. Green.

CHANNEL TUNNEL POSSIBILITIES.—The Chairman of the Channel Tunnel Co. Ltd., Mr. Leo F. A. d'Erlanger, has said in his report that the company has lost no opportunity to interest responsible authorities in the advantages of a Channel link with the Continent. There is good reason to believe,

he states, that the problems and possibilities of the scheme "are constantly being considered, not only here and on the Continent but even across the Atlantic."

CLYDE STEAMER FARES INCREASE.—Passenger fares on the Firth of Clyde steamer services provided by David MacBrayne Limited, which operates under a Government subsidy, were increased by 10 per cent. on September 1. This brings the company's fares into line with those of the British Railways Clyde steamer services, which also rose by 10 per cent. last Monday.

CLOSING OF BOTHWELL-HAMILTON BRANCH, SCOTTISH REGION.—On and from Monday, September 15, the Scottish Region announces, passengers and freight train services will be withdrawn from the Bothwell-Hamilton (L.N.E.) branch line; Burnbank, and Hamilton (L.N.E.) stations will be closed. Alternative passenger train services are available at Hamilton Central Station, and the Central S.M.T. Co. Ltd. operates an extensive bus service in the area. From the date of closing, passenger train parcels and miscellaneous traffic and freight train traffic formerly dealt with at Burnbank, and Hamilton (L.N.E.) stations will be handled at Blantyre, and Hamilton Central stations respectively. There will be no change in the position at Bothwell Station.

Electric Locomotive Performance in Switzerland

*Speeds of 75 m.p.h. sustained up 1 in 100 with
57½-ton locomotives hauling 270-ton to 310-ton trains*

By Cecil J. Allen, M.Inst.T., A.I.Loco.E.



Class "Re 4/4" Bo-Bo type locomotive with lightweight train, Swiss Federal Railways

A RECENT visit to Switzerland has confirmed that electric locomotive performance in that country today is of a higher standard than ever previously. With the widespread introduction of the modern 74 ft. 6 in. lightweight coaches, many more main-line trains have come into the lightweight category, and have been accelerated; also the introduction of the second series of Bo-Bo locomotives of the Swiss Federal "Re 4/4" type, with weight increased from 55 to 57½ tons (of 2,240 lb.), and horsepower rating increased from 2,240 to 2,500, permits the use of heavier trains, even on the fastest services. To travel between Lausanne and Geneva in a train weighing over 300 tons gross at a sustained speed of 78 to 80 m.p.h. behind one of these diminutive locomotives, which measure no more than 48 ft. 10 in. over buffers, is a startling experience.

"Re" 4/4 Performances

Table 1 gives details of a run in the westbound direction, with locomotive No. 442 and a ten-coach train of 279 tons tare and 305 tons gross. Notwithstanding a slight speed reduction through Renens, down the 1 in 100 to Denges a speed of 80 m.p.h. was attained 5½ miles after starting, but this was cut short by a severe relaying check. After regaining speed, the locomotive maintained 72-74 m.p.h. up the 1 in 125 from St. Prex to Allaman, and, later, a steady 75 m.p.h. up the 1 in 100 from Rolle to Gilly, which would require the locomotive's full

power output at the drawbar. Later, at Céligny, a speed of 80 m.p.h. was reached on the level. Over the 15.9 miles from

TABLE 1

SWISS FEDERAL RAILWAYS : LAUSANNE-GENEVA
Locomotive : Type Bo-Bo, Class "Re 4/4," No. 442
Load : 10 coaches, 279 tons tare, 305 tons gross

Dist.	—	Times	Speeds
miles		min. sec.	m.p.h.
0.0	LAUSANNE...	0 00	
2.8	RENENS ...	3 35	70½/65
5.2	Denges ...	5 35	80
7.8	MORGES ...	8 59	
10.5	St. Prex ...	12 09	72
12.0	Etoy ...	13 21	74
13.3	Allaman ...	14 25	73/79
16.5	ROLLE ...	16 54	78
18.4	Gilly ...	18 22	75
21.0	Gland ...	20 20	78
23.0	Prangins ...	21 55	78
23.9	NYON ...	22 40	72
26.0	Crans ...	24 20	77½
27.0	Céligny ...	25 01	80
29.2	Coppet ...	26 45	75
32.3	Versoix ...	29 25	70
34.6	Les Tuileries ...	31 22	76½
35.2	Chambésy ...	32 00	
37.4	GENEVA ...	34 55	

Net time : 32½ min.

* Speed restriction. † Speed eased.
Gradients :—
Lausanne-Denges : mainly 1 in 100 down
Morges-St. Prex : gradual rise
St. Prex-Allaman : mainly 1 in 125 up
Allaman-Rolle : partly 1 in 100 down
Rolle-Gilly : 1 in 100 up
Gilly-Crans : gently falling gradients
Crans-Genève : level

Allaman to Coppet speed averaged 77.4 m.p.h., and over the 24.1 miles from St. Prex to Les Tuileries 75.1 m.p.h. The 36-min. schedule for the 37.4 miles from Lausanne to Geneva was cut to 34 min. 55 sec., or, allowing for the Morges

slowing, to 32½ min. net from start to stop.

In the reverse direction (Table 2) the same locomotive had a load of nine vehicles, of 242 tons tare and 265 tons gross, on a train with intermediate stops at Nyon and Morges. A permanent way slowing caused slight loss of time from Geneva to Nyon, but the run from there to Morges, in a time of no more than 14 min. 36 sec. for the 16.1 miles start to stop, was the fastest that the writer has ever recorded over so short a distance. Up the 1 in 125 from Vernay to Gilly speed fell only from 79 to 76½ m.p.h., and up the 1 in 100 from Rolle to Perroy by the same amount, while 81½ m.p.h. was maintained on the level after St. Prex. Over the 12.2 miles from Gland to km. post 46 the average speed was 78.4 m.p.h.

On the short run from Morges to Lausanne a striking feat was the attainment of 75 m.p.h. up the 1 in 100 gradient from Denges; speed was then reduced to 60 m.p.h. for the Renens curves. Even so, with the usual slow approach, time was no more than kept on the sharp booking of 9 min. for the 7.8 miles, of which 4½ miles are at 1 in 100 up. From Geneva to Nyon this

TABLE 2

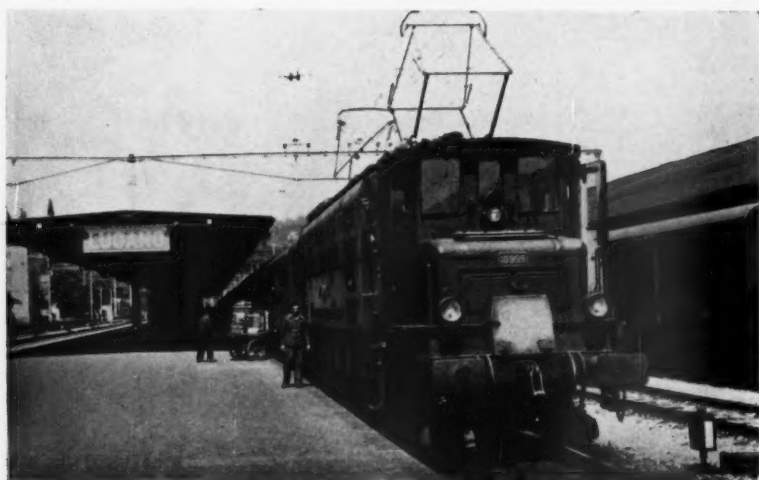
SWISS FEDERAL RAILWAYS : GENEVA-LAUSANNE
Locomotive : Type Bo-Bo, Class "Re 4/4," No. 442
Load : 9 coaches, 242 tons tare, 265 tons gross

Dist.	—	Times	Speeds
miles		min. sec.	m.p.h.
0.0	GENEVA ...	0 00	
2.2	Chambésy ...	3 42	
4.0	Genthod ...	5 24	63
5.7	Pont-Céard ...	7 01	64
7.4	Tannay ...	8 37	65½
8.2	Coppet ...	9 20	68
9.5	Founex ...	10 37	
10.4	Céligny ...	12 40	
12.7	Bois-Bougy ...	15 06	68
13.5	NYON ...	16 13	
0.9	Prangins ...	2 00	
2.9	Gland ...	3 59	76½
4.6	Vernay ...	5 17	79
5.5	Gilly ...	5 59	76½
7.4	ROLLE ...	7 26	79
8.8	Perroy ...	8 31	76½
10.6	Allaman ...	9 56	76½
13.4	St. Prex ...	12 04	81½
15.1	Km. 46 ...	13 19	81½
16.1	MORGES ...	14 36	
1.6	Lonay ...	2 27	57½
2.6	Denges ...	3 30	65½/75
5.0	RENENS ...	5 29	60
7.8	LAUSANNE ...	9 03	

* Speed restriction

train is allowed 15 min., and from there to Morges 16 min.

The running of the same locomotive over the heavily-graded line between Lausanne and Berne was of great interest, though the constant sharp curvature forbids the attainment of such high speeds as those just mentioned, and calls for constant speed reductions. Westbound, with the 11.20 a.m. from Berne,



Swiss Federal Railways "Ae 4/7" class 3,300 h.p. locomotive at Lugano Station. The wheel arrangement is 2-Do-1

No. 442, with 305 tons, covered the 19.4 miles to Fribourg in 20 min. 51 sec. start to stop; the section is mainly adverse, and includes $3\frac{1}{4}$ miles up at 1 in 100 between Flamatt and Schmitten. Including two severe slacks due to the widening works between Fribourg and Romont, now in part completed, the 41.0 miles from Fribourg to Lausanne occupied 47 min. 49 sec., a slight gain on the 49 min. allowed.

Eastbound, with the 3 p.m. from Geneva, No. 442 gave a remarkable exhibition of hill-climbing from the Lausanne start. In 10 miles, to the summit at Corbérion, it is necessary to surmount a difference in level of 775 ft. By Conversion, up 1 in 55, the locomotive,

hauling 265 tons, had attained 46 m.p.h.; less than $\frac{1}{2}$ -mile of level then raised the speed to 52 $\frac{1}{2}$ m.p.h. On the next stretch, to Grandvaux, varying in steepness from 1 in 53 to 1 in 59, there was a slight fall to 49 m.p.h., recovering to 53 m.p.h. on the 1 in 59, and to 55 $\frac{1}{2}$ on the short level through Grandvaux station; while on the subsequent 1 in 55 speed was 50 m.p.h. when power was cut off for the stop at Puidoux-Chexbres.

Conversion, 2.5 miles, was passed in 4 min. 21 sec.; Grandvaux, 5.2 miles, in 7 min. 27 sec.; and Puidoux, 7.4 miles, was reached in 10 min. 19 sec. (schedule 11 min.). The maximum sustained h.p. output on this climb was about 2,100.

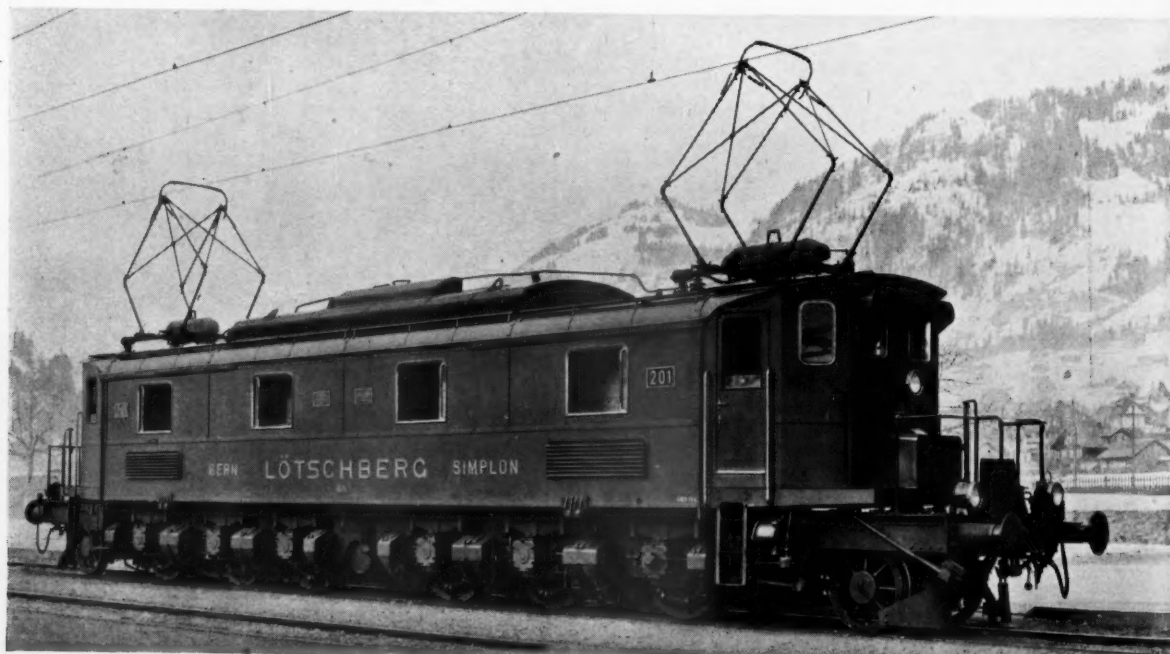
Later in the journey, the 28.2 miles from Palézieux to Fribourg, with a severe check past the widening works, were completed in 32 min. 35 sec., and from Fribourg the train passed Bümpliz, 16.8 miles, in 16 min. 39 sec., at 77 $\frac{1}{2}$ m.p.h., and despite a severe signal check stopped in Berne, 19.4 miles, in 20 min. 51 sec., 1 min. early.

During recent years there has been much schedule cutting in the Rhone valley, and trains on the Simplon main line, most of which make numerous stops, are very sharply timed, notwithstanding loads which in the summer attain considerable dimensions. The locomotives used on these workings are chiefly of the 2-Do-1 type, Swiss Federal series "Ae 4/7," which with their 75 tons of adhesion and 3,300 h.p. rating have exceptional powers of acceleration.

Runs on the Simplon Line

On one typical run timed by the writer, the 8.11 a.m. from Lausanne left Territet with 17 bogie vehicles weighing 554 tons tare and about 610 tons gross (the train being very full), hauled by No. 10967.

In no more than 2.0 miles, to Villeneuve, speed had risen to 66 m.p.h.; the 7.2 miles from the start to Yverne were run in 8 min. 25 sec.; and Aigle, 8.25 miles, was reached in 10 min. 54 sec., start to stop. The train had started late, and 3 min. were regained on this short stretch. Start to stop in each case, and with very slow stops owing to the length of the train, the 5.1 miles from Aigle to Bex were run in 7 min. 3 sec., and the 2.6 miles from Bex to St. Maurice in 4 min. 32 sec. At St. Maurice the load was reduced to 15 (499 tons tare and



Class "Ae 4/4" 1-Co-Co-1 type locomotive, 5,280 h.p., of the Berne-Lötschberg-Simplon Railway

550 tons gross), and the 9.3 miles from here to Martigny were run in 12 min. 18 sec.; finally, with 12 bogies of 404 tons tare and 445 tons gross, No. 10967 covered the 16.2 miles from Martigny to Sion in 17 min. 51 sec. From Aigle onwards the running, with maximum speeds of 61 to 67 m.p.h. between all stops, was no faster than the timetable demands.

In the reverse direction, another 2-Do-1 of the same type, with a lighter load of 8 bogies from Sion, 9 from Martigny, and 12 (440 tons) from St. Maurice, made some very fast start-to-stop times—in particular 17 min. 4 sec. for the 16.2 miles from Sion to Martigny; 10 min. 29 sec. for the 9.3 miles from Martigny to St. Maurice; 6 min. 39 sec. for the 5.1 miles from Bex to Aigle; and 7 min. 27 sec. for the 6.2 miles from Aigle to Villeneuve. Accelerations from the dead starts were

extremely rapid, as is witnessed by such times as 5 min. 13 sec. for 4.5 miles, 3 min. 57 sec. for 3.1 miles, and 4 min. 17 sec. for 3.4 miles, with speeds of from 64 to 66 m.p.h. attained in all cases in these distances. Yet the schedule times for the four sections mentioned above—18, 11, 7, and 8 min. respectively—were not being improved on by more than $\frac{1}{2}$ to 1 min. in each case.

Lötschberg Locomotive Performance

Another experience of considerable interest was on the Lötschberg line, from Spiez up to Kandersteg, when one of the 140-ton 1-Co-Co-1 locomotives of the "Ae 6/8" type, No. 205, rated at 5,280 h.p., had to work a load of 15 bogie vehicles, weighing 518 tons tare and 560 tons gross, the train being very crowded. Out of Spiez the line climbs at 1 in. 67, but Heustrich, 3.2 miles, was

passed in 5 min. 13 sec.; Frutigen, 431 ft. above Spiez in level and 8.4 miles distant, was reached in 15 min. 12 sec., after various easings for curves and a very cautious run in to the stop.

In the next 11.2 miles, to Kandersteg, the train requires to be lifted 1,301 ft., mainly on the ruling gradient of 1 in 37, which is compensated for the almost continuous curvature. The time from Frutigen to Kandersteg was 18 min. 39 sec. start to stop; from Kandergrund to Felsenburg, pass to pass, the 6.0 miles were covered in 9 min. 8 sec., at an average of all but 40 m.p.h. On the initial 1 in 37 stretch, speed rose to 37½ m.p.h.; the short level through Blausee-Mitholz raised it to 50 m.p.h., and the remainder of the 1 in 37 was negotiated at a steady 39 to 41 m.p.h. This would require an equivalent drawbar h.p. of about 4,825, or very nearly the full rated output of the locomotive.

Laminated Shoebeams for Rolling Stock

Built-up beams of birch plywood to be used on London Transport cars of various types



Laminated shoebeam made by Saro Laminated Wood Products Limited

BEFORE the war, high-grade naturally-seasoned teak was used for the shoe-beams which support and insulate the current collector shoes on London Transport trains. When supplies of this material ceased during the war it was necessary to make do with kiln-dried timber, iroko (also known as kambala) being mainly used. Artificially-seasoned shoebeams, however, are liable to splitting and other defects under arduous service conditions, so consideration was given to various substitutes.

As a result of publicity given to the experimental use in 1946 of insulated tubular steel, the Forest Products Research Laboratory of the Department of Scientific & Industrial Research suggested that laminated timber might prove a suitable alternative. This could be built up from small sections of timber, bonded together with a weather-

proof glue of synthetic resin type; the finished article should have very good electrical and mechanical properties, whilst avoiding scarce materials.

Four experimental beams were manufactured by the laboratory from English oak supplied by London Transport, a cold-setting phenol-formaldehyde resin glue being used. For purposes of comparison two beams had the glue lines in a vertical plane and two in a horizontal plane, whilst one beam of each type was of $\frac{1}{2}$ in. and the other of $\frac{3}{4}$ in. laminations, the grain running parallel to the neutral axis in all cases. The four beams were placed in service, on similar cars, in the middle of 1947. To date three of them have given no trouble, but the fourth (of which doubts were expressed at the time of manufacture) was found to have delaminated partly after some seven months' service.

In 1948 another experiment was initiated. One type of shoebeam in use on the Central Line has its centre section set up $1\frac{1}{2}$ in. above the ends, and the inclined portions of the beam are prone to splitting. It was thought that a laminated beam with vertical glue lines might overcome this difficulty, but the trial beams differed from those of the original experiment in that they were necessarily of multi-ply construction instead of having all the laminations longitudinally-grained. Birch was used instead of oak and the laminations were considerably thinner.

As a result of these trials, substantial orders have been placed for laminated shoebeams for various types of car. The production beams are of plywood board similar to that used in the Central Line experiment, built up from $\frac{1}{8}$ -in. birch, ash or mahogany veneers bonded with phenolic resin glue, scarf-jointing being permitted for all except the outermost veneers. The modern technique of radio-frequency internal heating is employed for curing the glue lines, so completing within ten minutes a process which takes many hours using conventional heating methods.

Although plywood shoebeams are made from material of considerably less natural durability than that used for solid beams, there is good reason to suppose that their performance under arduous service conditions will compare very favourably with that of existing solid beams, particularly when the present-day unreliability of available grades of solid hardwoods is considered. At the same time, although a manufactured article, the birch plywood beam is not appreciably more expensive than its solid iroko counterpart.

50-Cycle Locomotives for Hungary

Development of the Kando system using frequency converter and individual axle drive

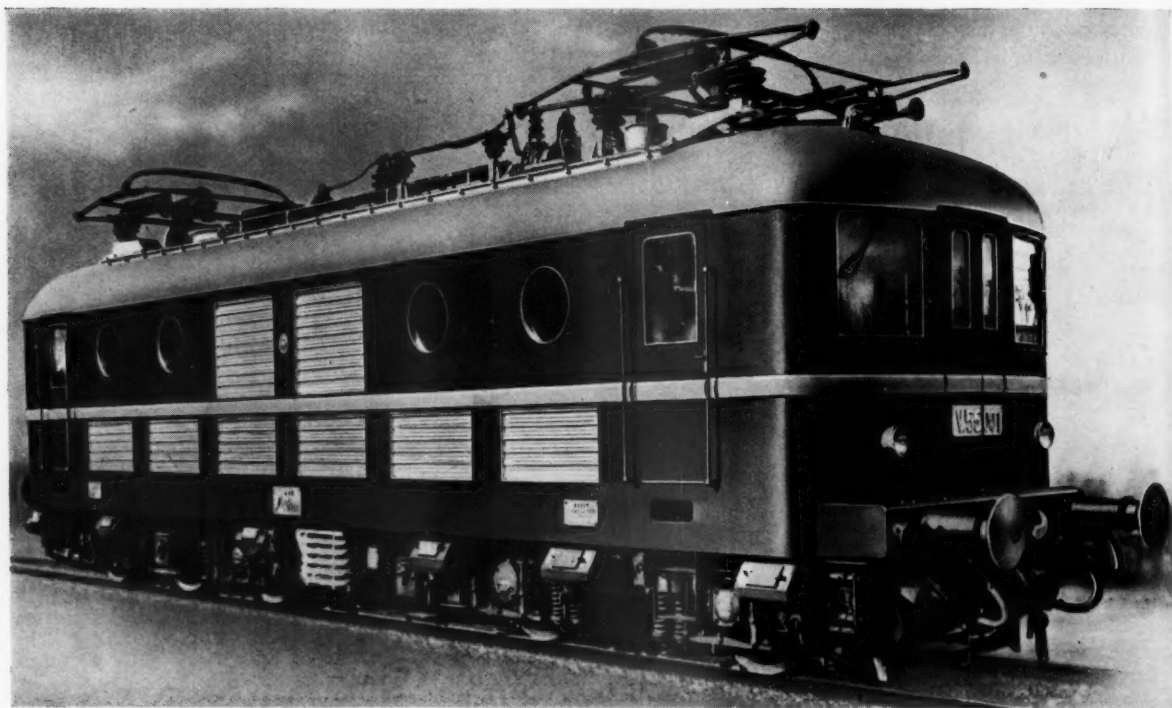
THE Hungarian State Railways, which since 1932-34 have been operating the Budapest-Komarom-Hegyeshalom main line on the Kando 50-cycle electrified system, have from 1950 onwards put into traffic a number of five-motor phase- and frequency-converter locomotives of the unusual Bo-Co wheel arrangement. These are to supplement and eventually replace all the old single-motor 1-D-1 rod-drive locomotives, partly because the 20-year-old design is not suitable for development to run

new double-bogie Bo-Co type represents the latest development. All these locomotive classes have been built jointly by Ganz and the Mavag works, in Budapest.

Bogies, with all-welded frames, are of the Ronai type, without a centre pivot and with four weight supports. This construction, apart from riding qualities, gives the greatest possible space within the frame structure; and as a result it was possible to use a three-phase slip-ring induction motor, with

and 21,000 lb.) respectively. These correspond to overload ratings, the 3,200 nominal horsepower output at the fifth and fourth speeds being the one-hour rating.

The wheelbases of the four-wheel and six-wheel bogies are 8 ft. 2½ in. and 11 ft. 6 in. respectively. Length over buffers is 47 ft. 10 in., and total weight 85 tons, distributed almost equally at 17 tons per axle. This weight is equivalent to 59½ lb. per h.p. at the one-hour rating. Of the total, the elec-



Single-phase to three-phase converter locomotive on the Kando system for the Hungarian State Railways; the wheel arrangement is Bo-Co

at higher speeds than the original 100 km.p.h. (62 m.p.h.).

The original locomotives had phase-converters to provide a three-phase current for the traction motors, the line supply being single-phase. Speed control was by pole-changing in the single driving motor. Sixteen slip rings were required for the connections to the speed-control contactors. It is not practicable to apply individual pole-change motors to each driving axle in order to increase the power available; therefore, about 1943, moves were made to add frequency converters to the locomotive equipment, and some rigid-frame locomotives with four driving axles and four motors were completed in 1946. The

nose-suspension, for each axle, and with a one-hour individual output of 640 h.p. These motors drive the axles through single gears with a ratio of 1 to 3.72. All the motors are hung towards the centre of the locomotive. Axleboxes have SKF roller bearings. All ten 41-in. wheels are braked by two blocks applied by clasp rigging, and Knorr straight and automatic air brake equipment is fitted.

Control gear is arranged to give five speeds, namely 25, 50, 75, 100 and 125 km.p.h. (15½, 31, 46½, 62½, and 77½ m.p.h.); and the maximum wheel-rim tractive efforts at these speeds are: 21,000, 21,000, 16,000, 12,000, and 9,600 kg. (46,300, 46,300, 35,100, 26,400,

and 21,000 lb.) respectively. These correspond to overload ratings, the 3,200 nominal horsepower output at the fifth and fourth speeds being the one-hour rating.

Performance Figures

The locomotives will haul freight trains of 1,500 tonnes up a 1 in 250 gradient at a speed of 46½ m.p.h., and will handle 750-tonne passenger trains at their maximum speed of 77½ m.p.h. Regeneration occurs automatically if the synchronous speed selected is exceeded, because of the inherent characteristics of the three-phase induction motors, and this characteristic can be used to maintain a steady speed on down gradients.

The Quebec, North Shore & Labrador Railway

A 360-mile line being built from the St. Lawrence to serve the large Quebec-Labrador ore deposits

FOR reasons explained in an editorial note on page 254, the construction of a railway from Seven Islands, on the north shore of the St. Lawrence estuary, to Knob Lake, adjacent to the great iron-ore deposit on the borders of Quebec Province and Labrador, has recently become a matter of vital importance to the North American Continent. Work was therefore recently put in hand to build this 360-mile line designed to carry the 400,000,000 tons of ore to the coast, initially at the rate of about 9,000,000 tons a year.

The ore is on or near the surface, with an average depth of overburden of only 8 ft.; the mining will therefore be open-cast or shallow working. Because the severe climate will limit mining to six months in each year, the ore will be excavated and carried in lorries and conveyors to dump hoppers at Knob Lake railhead. The intention is to run five or possibly seven trains a day from May to the end of October, each of 115 wagons and carrying 14,000 tons of ore, so as to deliver 50,000-70,000 tons at Seven Islands daily. Each train will be hauled by four 1,600-h.p. diesel-electric units.

The whole line is, however, designed for moving eventually 20,000,000 tons of ore each season, and the initial 22 passing sidings allow for the practical potential movement of up to 36 trains a day. Only the installation of a second car dumper and some yard extensions will be necessary for this expansion in traffic.

To handle this traffic, a single line is being constructed in the first instance, with mile-long crossing loops spaced about 30 miles apart. The points at the south ends of the loops are to be remote-controlled by C.T.C., and those at the north ends will be spring points. The ruling gradient against loaded trains will be 1 in 333, but trains returning empty will have to negotiate gradients as steep as 1 in 55.

From Seven Islands to mile 97 the new line traverses rough terrain and climbs to 1,885 ft. at mile 94, this rise including eight miles of the 1 in 55 ruling gradient between miles 67 and 75. The succeeding 100 miles are easily graded through open rolling country to the summit of the line, 2,056 ft., at mile 194. A plateau covered with a thin layer of muskeg and studded with small lakes is then traversed; the line falls gradually to Knob Lake, elevation 1,670 ft. In the rugged country south of mile 97 the sharpest curves used will be of 11 chains, but elsewhere curvature will be easy.

Engineering Works Involved

The alignment crosses three rivers, the Moisie at mile 12, the Ashuanipi, 35 miles short of Knob Lake, and the Hamilton at mile 328. The Moisie will



The Labrador iron-ore line now under construction, in relation to existing railways

be crossed by a bridge 680 ft. long, having three continuous main deck spans, with a rail level of about 150 ft. above the river bed. A steel trestle bridge will cross the Hamilton river, but over the Ashuanipi the line will be

laid across an earth and concrete dam to be constructed for impounding the water of the Menihik lakes to provide hydro-electric power for the mines and settlements. Altogether there will be 25 steel bridges of over 40 ft. in length, six of them exceeding 200 ft. Only one tunnel was necessary, and has now been completed at mile 11½; it is 2,250 ft long.

The permanent way will consist of 132-lb. rails in the main line, and 100-lb. in the loops and sidings. Creosoted hardwood and field-treated local spruce sleepers will be used in about equal quantities.

At Seven Islands, general offices and maintenance shops to cater for diesel locomotives and rolling stock are being built; there will also be storage facilities. Seven Islands bay is a natural harbour in which vessels can come alongside within 12 ft. of the natural water's edge. A temporary pier has been constructed, and eventually elaborate plant is to be installed for handling the ore.

Rolling Stock

The rolling stock will comprise 55 diesel-electric units, 20 cabooses, and 2,400 95-(short) ton ore wagons. These wagons are larger than any others at present in use in Canada, and will be fitted with roller-bearing axleboxes and 36-in. instead of the usual 33-in. dia. wheels. Empty and load clasp-brakes and semi-tight lock couplers are included in their equipment. Other stock will be 175 ballast wagons, 50 boarding cars,



Construction of formation



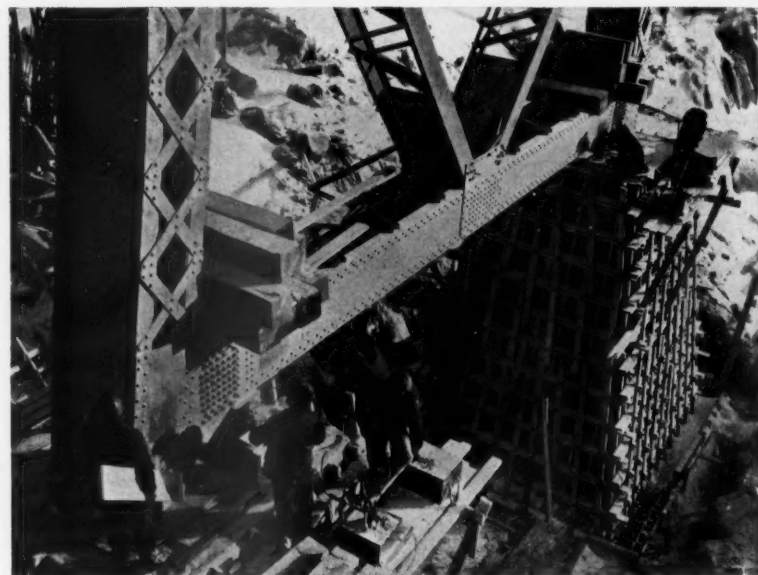
Excavating for cutting

20 air dump cars and 100 flat, 15 tank and 20 box wagons, and two 250-ton breakdown cranes.

For operating, the line will form two sub-divisions of 180 miles each. Train movements will be by C.T.C., supplemented by end-to-end radio communications. At loops the loaded trains, it is proposed, will keep to the straight track. Motive power and cabooses will work through between Seven Islands and Knob Lake, but crews will change halfway, at Midway, where accommodation will be provided for them. Tentative running times are 14 hr. for loaded and 12 hr. for empty trains.

Terminal Train Movements

At Seven Islands there will be extensive receiving, classification, departure, and stock-pile yards as well as repair tracks, involving some 40 miles of permanent way. A train arriving will pass over remote-controlled points into the receiving yard, but on the way in the caboose will be detached and run by gravity to the departure yard, where it will remain on a caboose road so graded that, when required for another outgoing train, the nearest caboose will run by gravity on to the tail of that train. To segregate the different grades of ore, the incoming train will be pushed over



Construction of bridge over Moisie River

a hump leading to the classification yard. On the way over the hump each wagon will be automatically weighed and inspected by an inspector in an inspection

pit; he will mark defective vehicles requiring repairs. From the classification roads, wagons will be moved to a car dumper by between-track, side-pusher engines.

Ore Unloading Facilities

The ore will then be discharged from the wagons by a tandem dumper, handling two wagons at a time, and fed to twin mechanical feeders and belt conveyors capable of moving 3,200 tons an hour. These will deliver it to a single conveyor discharging into a 1,200-ton surge bin on the quay. From the bin the ore will gravitate through more mechanical feeders to two dock conveyors, moving 4,000 tons an hour. Finally, travelling loaders will pick up the ore from these conveyors and deliver it to vessels at an average rate of 7,000 tons an hour.

To provide electric power for this terminal, a second dam is being constructed across the St. Marguerite river

some 15 miles to the west of Seven Islands. By 1953 each of the two hydro-electric plants is expected to produce 30,000 h.p.

FARE EVASIONS.—It was stated at Skegness magistrates' court recently that railway fare offences by naval ratings had become a matter of great concern to senior officers of the command, at both Sheerness and Chatham. Notices issued by the C-in-C, the Nore had been posted in naval establishments, and the ratings were subject to naval punishment if they were convicted by a civil court.

ANTI-FRICTION BEARINGS.—Representation in Great Britain of RIV Officine di Villar Perosa, Turin, is now in the hands of Revolve Limited, 399, Edgware Road, London, which is the company's sole conces-

sionaire. With three factories in Italy, having a total floor area exceeding 200,000 sq. m., and with a labour force approximating to 12,000 persons, RIV manufactures ball, roller, taper roller, cylindrical roller, and spherical roller anti-friction bearings in metric and inch sizes.

SCOTTISH REGION HALT TO CLOSE.—The Scottish Region announces that on and from Monday, September 15, passenger and freight train services will be withdrawn from Esslemont Halt and siding (Aberdeenshire). Alternative rail facilities are available at Logierie, and Ellon stations, for passenger and freight traffic.

IRON AND STEEL PRICE CHANGES.—A new Iron and Steel Prices Order came into force on August 25. The prices of certain qualities of alloy steel and stainless products have been revised to take account, amongst other factors, of the changes in production caused by measures taken to conserve nickel and molybdenum; and also to take account of increases in the prices of alloy materials. The Order also removes blast furnace ferro-manganese from statutory control. The price will in future be fixed by agreement between the makers and the Minister of Supply. Rainwater and soil goods, gutters and connections are removed from Iron and Steel Price Control.

RAILWAY NEWS SECTION

PERSONAL

BRITISH TRANSPORT COMMISSION

The Minister of Transport, Mr. A. T. Lennox-Boyd, has announced that he has re-appointed the Chairman and three full-time Members of the British Transport Commission, whose present appointments expired on August 31, for a further term of one year. These are:— Lord Hurcomb, G.C.B., K.B.E. (Chairman), Mr. John

Superintendent and was posted to the North Western Railway. In the winter of 1926-27 he spent some months in Great Britain on the study of British railway practice, including the publicity organisation of the London & North Eastern Railway. In 1929, he was appointed as Assistant Chief Publicity Officer in the Central Publicity Bureau of the Government of India (Railway Board). In 1930, he was appointed Assistant Manager of the

Mr. S. M. Hasan, General Manager, Eastern Bengal Railway, who, as recorded in our August 1 issue, has been appointed as Director General of Railways, Pakistan, was born in 1903. On graduating with distinction from the Thomason Civil Engineering College, Roorkee, in 1926, he was appointed to the Indian Railway Service of Engineers and posted to the Great Indian Peninsula Railway. He served on that railway until 1946 and was its



Mr. F. M. Khan
Director General of Railways, Pakistan,
1950-52



Mr. S. M. Hasan
Appointed Director General of Railways,
Pakistan

Benstead, C.B.E., Lord Rusholme, and Sir William Wood, K.B.E.

The other Members of the Commission whose appointments are not affected are:— Mr. F. A. Pope, C.I.E. (full-time), and Captain Sir Ian Bolton, Bart., O.B.E., Mr. John Ryan, C.B.E., M.C., and Mr. H. P. Barker (part-time).

We regret to record the death on August 23 of Mr. K. A. Fraser, O.B.E., A.M.I.E.(Aust.), M.Inst.T., Commissioner for Railways, New South Wales.

Mr. Reginald Winsor, Director of Transport & Highways, New South Wales, since the establishment of the Transport & Highways Commission in 1950, has been appointed Commissioner for Railways.

Mr. F. M. Khan, who, as recorded in our issue of August 1, retired from the position of Director General of Railways, Pakistan, on July 1, joined the Indian State Railway Service in 1918 as Assistant Traffic

Indian Railways Publicity Bureau in London, of which he was Manager from 1932 to 1934. On his return to India, Mr. Khan was posted to the N.W.R. in 1935 as Senior Assistant (Personnel) at Headquarters. In 1936, he was appointed Deputy Director, Establishment, Railway Board. In 1938, he returned to the N.W.R., serving as Divisional Transportation Officer, Deputy Chief Operating Superintendent, Deputy Chief Commercial Manager, and Senior Assistant (Movements). In January, 1945, he was promoted Divisional Superintendent (Senior) and transferred back to the Railway Board as Director of Traffic, in which post he was confirmed in December of that year and continued until Partition. In July, 1947, Mr. Khan was appointed by the Government of the new Dominion of Pakistan as General Manager of the North Western Railway. In April, 1950, on the death of the former Director General, Mr. Mohammad Nizam-ud-Din, he was appointed Director General of Railways.

Deputy General Manager (Staff) when he was specially selected by the Railway Board to represent the nine Indian Railways' case before the Adjudicator. On completion of that assignment early in 1947, Mr. Hasan was appointed as the Director, Establishment, with the Railway Board and was sent to Geneva as the Government of India Delegate to the Inland Transport Committee of the I.L.O. On partition of India in August, 1947, Mr. Hasan went over to Pakistan and served as the Chief Engineer, North Western Railway, Director of Establishment in the Railway Division and Chief Engineer in charge of the 14-crore Chittagong Port Development Project, before becoming General Manager of the Eastern Bengal Railway in August, 1950. He relinquished the General Managership of the Eastern Bengal Railway at the end of June this year, to take over the duties of the Director General of Railways, with authority over both the North Western and Eastern Bengal systems.



Mr. H. D. Sharpe

Appointed Assistant to Commercial Superintendent (Traffic & Routes—Goods), Eastern Region

Mr. H. D. Sharpe, Senior Clerk, Traffic (Goods Section), Commercial Superintendent's Office, Eastern Region, Liverpool Street, who, as recorded in our August 1 issue, has been appointed Assistant to Commercial Superintendent (Traffic & Routes—Goods), Eastern Region, entered the service of the North Eastern Railway at Hull in 1912 and served at various stations in the area. He served in H.M. Forces from 1915 to 1919. He went to Birkenhead after the grouping and in 1929 joined the staff of the Liverpool District Goods Manager's Office as Assistant Transit Clerk, becoming Senior Transit Clerk in 1931 and Outdoor Representative, Liverpool, in 1933. In 1935, Mr. Sharpe was appointed Head of Traffic & General Section, London Suburban District Goods Manager's Office, Kings Cross, and Head of Claims Section in the same Office in 1942. In 1943 he became Deputy Head of Traffic Section, Goods Manager's Office, and in 1945 he was elected to open and take charge of the newly formed London City & Suburban Joint Traffic Regulating Office. He returned to the Goods Manager's Office, Liverpool Street, as Deputy Head of Traffic Section in July, 1946, and became Senior Clerk, Traffic (Goods Section), Commercial Superintendent's Office, on the reorganisation of the Department after nationalisation.

The Eastern Region announces the appointment of Mr. S. A. Claydon, Assistant District Operating Superintendent, Leeds, North Eastern Region, as Assistant Manager (Shipping Services) Parkston Quay, in succession to Mr. R. R. M. Barr.

We regret to announce the death on August 17 of Mr. F. Fenn, A.I.Mech. E., Liaison Engineer of Industrial Truck Development (in association with Austin Crompton Parkinson Electric Vehicles Limited) working in close collaboration with the Home and Overseas Sales Divisions and the company's Projects & Planning Branch. Mr. Fenn was one of the oldest members of I.T.D. Limited staff and one of the first executives to join I.T.D. Limited; he was responsible for producing the first Stacatruc fork lift truck in 1946.



Mr. F. J. Lloyd

Appointed Assistant Staff Administration Officer, London Transport Executive

Mr. F. J. Lloyd, B.Sc., F.I.A., Principal Executive Assistant in the Office of the Staff Administration Officer, London Transport Executive, who, as recorded in our July 11 issue, has been appointed an officer of the Executive, with the title of Assistant Staff Administration Officer, will be responsible for the actuarial and pension work of the Staff Administration Office, the central record of staff statistics and the organisation and methods section. He is 39, and was educated at Ackworth School, York, and at Liverpool University, where he obtained the degree of B.Sc. in mathematics. He became a Fellow of the Institute of Actuaries in 1947. After service with the Royal Insurance Co. Ltd., Liverpool, Mr. Lloyd joined London Transport in June, 1947, and was appointed Principal Executive Assistant in the Office of the Staff Administration Officer in January, 1949. During the recent war he served in the National Fire Service from 1940 to 1941, and between 1942-45 was engaged on operational research in Bomber Command of the R.A.F.

We regret to record the sudden death, on August 25, of Mr. J. B. Stevenson, for many years Secretary of Andrew Barclay, Sons & Co. Ltd., Caledonia Works, Kilmarnock.

CANADIAN PACIFIC RAILWAY

The following appointments are announced by the Canadian Pacific Railway Company, as effective from September 1:—

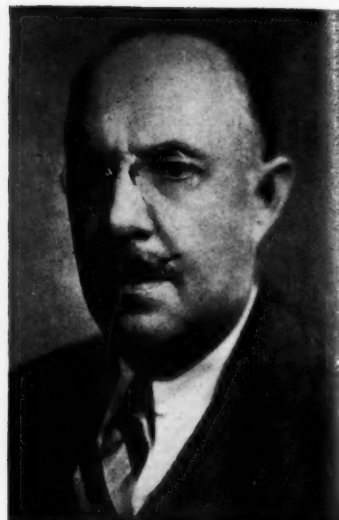
Mr. D. O. Beaton, General Agent for Northern Ireland and Eire, is transferred to London as Manager, Cruise Department.

Mr. C. C. F. Young, Passenger Agent, Liverpool, succeeds Mr. Beaton as General Agent for Northern Ireland and Eire, with headquarters at Belfast.

Mr. R. H. Hobern, Assistant General Agent, Passenger Department, London, to be Passenger Agent Liverpool in succession to Mr. Young.

Mr. F. L. H. Burton, Passenger Agent, Manchester, to be Assistant General Agent, Passenger Department, London, succeeding Mr. Hobern.

Mr. W. Richardson to be a Passenger Agent, Manchester.



Mr. Alfred J. Ball

Foreign Freight Traffic Manager, Pennsylvania Railroad, U.S.A., 1929-52

Mr. Alfred J. Ball, Foreign Freight Traffic Manager of the Pennsylvania Railroad, U.S.A., who, as recorded in our August 22 issue, has retired, joined that Railroad in 1900 in the Empire Line Office, a special freight service then operated by the Pennsylvania Railroad. His father, the late Mr. George M. Ball, retired as Manager of the Empire Line in 1915. Mr. Ball was appointed Agent of the Empire Line, Philadelphia District, in 1908 and following interim promotions, became Foreign Freight Agent for the Pennsylvania Railroad in 1916. During the first world war, in addition to his duties with the Pennsylvania, he served as Traffic Control Manager for the United States Railroad Administration, Port of Philadelphia. Following other promotions, Mr. Ball was appointed Foreign Freight Traffic Manager in 1929. He has been responsible for various port improvements and has initiated projects for the development and expansion of water front facilities at New York, Philadelphia, and Baltimore, in the interest of efficient and economic handling of foreign commerce. Mr. Ball was responsible for all overseas commercial relations and in this capacity visited Great Britain on numerous occasions.

Mr. S. F. McDermott, Assistant to the Traffic Manager, American Car & Foundry Company, has been appointed Traffic Representative in charge of all traffic, domestic and foreign. He was born and educated in New York City. After service with the Central Railroad of New Jersey, Mr. McDermott joined the A.C.F. export department in 1927, was placed in charge of export traffic in 1948, and was appointed to his present position in 1951.

SCOTTISH REGION APPOINTMENTS

The following appointments have been announced by British Railways, Scottish Region:—

Mr. Edwin Lees, District Traffic Superintendent, Carlisle, to be District Traffic Superintendent, Ayr.

Mr. T. W. Royle, Assistant to District Operating Superintendent, Leeds City, to be Assistant District Operating Superintendent, Burntisland.

Mr. B. D. Rampala, Chief Mechanical Engineer, Ceylon Government Railway, is on a visit to this country connected with orders for the Ceylon Government Railway in hand with British manufacturers. Mr. Rampala is visiting Brush Bagnall Traction Limited in connection with the order for 25 diesel-electric locomotives in hand with that firm.

LUNCHEON TO MR. STANLEY J. PAYNE

A luncheon was held at the Abercorn Rooms, Bishopsgate, London, E.C.2, on August 29, to mark the retirement from railway activities of Mr. Stanley J. Payne; as recorded in our issue of June 6, Mr. Payne recently resigned from the Argentine Ministry of Transport Purchasing Commission in London to take up another appointment in the City.

Mr. L. W. Hawkins, of John W. Harker & Co. Ltd., presided, and speeches of appreciation of Mr. Payne's services to the world of transport were made by Mr. F. Moreton, of Messrs. Kaye, Son & Co. Ltd., Mr. N. F. E. Grey, the last secretary of the Buenos Ayres Great Southern Railway Co. Ltd., and by Mr. W. H. Palmer, of Messrs. J. Baker & Bessemer Limited.

Mr. Payne, in his reply, stated that he had been associated with the Buenos Ayres Great Southern Railway for 40 years, and during the period in which it was acquired by the Argentine Government he formed one of the members of the Comision del Ministerio de Transportes in London.

Others present were:—

The Hon. R. G. Lyttelton, Guest Keen & Nettlefolds Ltd.; Messrs. Andrew B. Henderson, Messrs. Livesey & Henderson; J. C. Ansaldo, Republica Argentina, Comision del Ministerio de Transportes; H. Melhuish, the Superheater Co. Ltd.; W. A. Dunbar, late of the Buenos Ayres Great Southern Railway Co. Ltd.; Norman Morris, J. Stone & Co. (Deptford) Ltd.; J. D. Lewis, Messrs. Fox & Mayo; Dudley Cooper, Docker Brothers Ltd.; R. Lee, J. Stone & Co. (Deptford) Ltd.; J. White, late of the B.A.G.S.R.;

T. D. Brotherton, the General Electric Co. Ltd.; P. W. Clifton, the Henricot Steel Foundry; Colonel W. L. Topham, the Vulcan Foundry Limited; Messrs. H. Kingston, Messrs. Livesey & Henderson; J. D. Johnson, the Superheater Co. Ltd.; J. Logan, Guest Keen & Nettlefolds Ltd.; C. Carnell, Arthur Balfour & Co. Ltd.; R. Drury, P. & W. McLellan Ltd.; O. Bevan Marks, Nye & Menzies Ltd.; W. Barnes, Asbestos & Engineering Products Ltd.;

Roger Gresley, George Stephenson & Co. Ltd.; D. G. Woodman, G. Turton, Platts & Co. Ltd.; A. W. Meacock, late B.A.G.S.R.; T. H. Riddings, Robert Ingham Clark & Company; C. L. Trask, the Birmingham Railway Carriage & Wagon Co. Ltd.; H. P. Salter, late B.A.G.S.R.; F. Towell, Siemens Electric Lamps & Supplies Limited; R. Wilson, Messrs. Dow & Wilson; F. Mason, Davis & Lloyd Limited; Rex Pasley, the Eyre Smelting Co. Ltd.; G. H. Ramsden, Messrs. Fox & Mayo;

Dudley H. Robinson, late B.A.G.S.R.; V. M. Marshall, Messrs. C. M. Hill & Co. (Engineers) Ltd.; G. E. Embleton, the Gloucester Railway Carriage & Wagon Co. Ltd.; A. J. Gibson, George Spencer Moulton & Co. Ltd.; A. S. Davidson, the Federated Engineers; W. J. Ash, Kenneth R. Pearson & Son; and H. G. Clark, the Peruvian Corporation Limited.

We regret to record the death on August 21 of Lt.-Colonel C. Q. Twist, M.B.E., Manager of the Paris Office of the British Travel & Holidays Association.

FUNERAL OF MR. C. B. COLLETT

The funeral of Mr. C. B. Collett, Chief Mechanical Engineer of the Great Western Railway from 1922 to 1941, took place on August 28 at Gap Road Cemetery, Wimbledon. Those present, in addition to family mourners, included:—

Sir Felix J. C. Pole and Sir James Milne, former General Managers of the Great Western Railway; Sir William Stanier, formerly Principal Assistant to Mr. Collett and Chief Mechanical Engineer, London Midland & Scottish Railway; Mr. F. W. Hawksworth, formerly Chief Mechanical Engineer, G.W.R., and British Railways, Western Region;

Mr. H. G. Bowles, Assistant Chief Regional Officer, Western Region (representing also Mr. David Blee, Member, Railway Executive, Mr. K. W. C. Grand, Chief Regional Officer, and Mr. C. Furber, Commercial Superintendent, Western Region);

Mr. W. A. L. Creighton, Electrical Assistant, Western Region (representing also Mr. R. A. Smeddle, Mechanical & Electrical Engineer);

Mr. K. J. Cook, Mechanical & Electrical Engineer, Eastern & North Eastern Regions and formerly Mechanical & Electrical Engineer, Western Region;

Messrs. F. C. Hall, formerly Principal Assistant to the Chief Mechanical Engineer, G.W.R.; C. T. Roberts, Carriage & Wagon Engineer, Western Region; H. G. Kerry, Assistant Motive Power Superintendent, Western Region (representing also Messrs. W. N. Pellow and Mr. A. W. H. Christison, Western Region); W. A. Creighton, Electrical Assistant to Mechanical & Electrical Engineer, Western Region; and H. Holcroft (formerly of the Southern Railway).

We regret to record the death on August 25, at the age of 72, of Sir John Forbes Watson, Director of the British Employers' Confederation since 1921. He was a Member of the National Joint Advisory Council and of the National Production Advisory Council on Industry from the time those councils were set up. He represented the International Labour Organisation at the World Economic Conference in 1933, and had served on the executive committee of the International Organisation of Employers since 1922 and was President of the organisation in 1932-33.

B.T.C. Members Visit to Northern Ireland

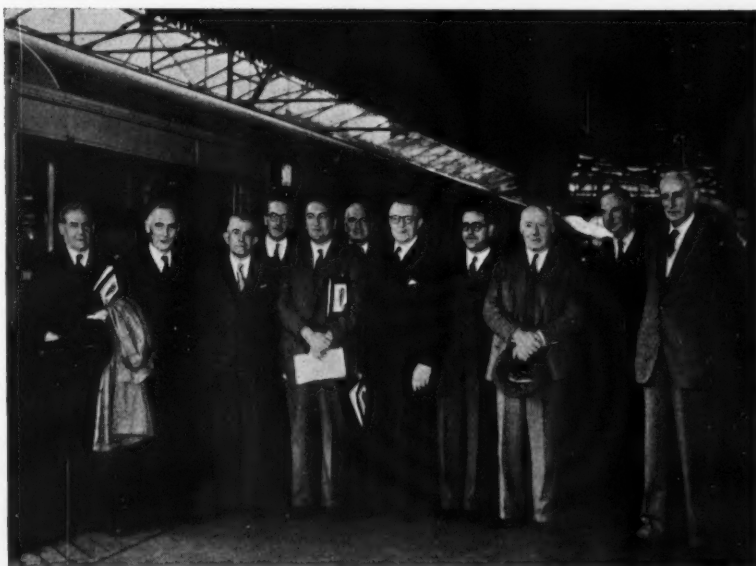
On August 13 and 14 Lord Hurcomb, Chairman of the British Transport Commission, accompanied by Mr. John Benstead, Deputy Chairman; Mr. F. A. Pope, Member; and Messrs. H. P. Barker and John Ryan, part-time Members; visited Northern Ireland.

The party, as briefly reported in our August 22 issue, made an inspection of various activities of the Ulster Transport Authority, particularly the road-rail workshops at Duncrue Street, and saw the production of the six-coach multi-engine diesel trains, the first of which is already in service on the Belfast-Bangor section, and was illustrated in our April 25 issue. A matter of special interest was the new all-metal lightweight coaches incorporating integral design of underframe with the body.

During the visit an opportunity was taken to study a new system of transferring a road articulated trailer on to a railway wagon which is the subject of experiment to further road-rail integration methods. The technical staff of the U.T.A. has given this subject intensive study and the investigations have resulted in developing a device whereby an articulated road trailer up to a carrying capacity of 10 tons can be loaded transversely by the driver with the vehicle's own power on to a standard railway wagon.

In the new train and in the accompanying illustration is seen at Queen's Quay Station, Belfast, before departure. In the group, reading from left to right, are:—

Lord Hurcomb, Chairman, British Transport Commission; Messrs. John Benstead, Deputy Chairman; James Courtney, Chief Engineer, Ulster Transport Authority; James Hutton, Chief Traffic Manager, Ulster Transport Authority; Messrs. H. P. Barker, F. A. Pope, and John Ryan, Members of B.T.C.; Messrs. James A. Clarke, General Manager, Ulster Transport Authority, J. S. Rogers, Chairman, Ulster Transport Authority, Wilson Smyth, Vice-Chairman, Ulster Transport Authority, and Sir Anthony Babington, Chairman, Northern Ireland Transport Tribunal.



Lord Hurcomb with officials of the U.T.A. and B.T.C. at Queen's Quay, Belfast

British Transport Commission Statistics (Period No. 7)

Summary of the principal statistics for the four-week period ending July 13

STAFF

	B.T.C. Head Office	British Railways	London Transport	British Road Services (Road Haulage)	Road Passenger (Provincial & Scottish)	Hotels & Catering	Ships & Marine	Inland Waterways	Docks, Harbours, Wharves	Railway Clearing House	Commer- cial Adver- tisement	Legal	Films	Total
Number ...	284	610,484	98,687	75,386	63,237	16,862	6,556	4,820	21,154	593	199	321	42	896,825
Inc. or dec.	—	+298	-165	-395	+982	+300	+111	-23	-2	-15	+2	-5	+3	+1,191

BRITISH TRANSPORT COMMISSION TRAFFIC RECEIPTS

	Four weeks (Period No. 7)		Aggregate for 28 weeks	
	1952	1951	1952	1951
	£000	£000	£000	£000
British Railways—				
Passengers	10,532	10,770	55,313	53,347
Parcels, etc., by passenger train	2,799	2,655	18,771	17,421
Merchandise	7,803	7,782	56,467	52,308
Minerals	3,130	2,848	22,478	19,111
Coal & coke	7,588	6,991	55,207	48,596
Livestock	125	68	753	561
	31,977	31,114	208,989	191,344
British Road Services—				
C. & D. and other road services	915	859	6,223	5,593
Ships and Vessels	1,233	1,326	5,449	5,595
London Transport—				
Railways	1,405	1,240	9,503	8,618
Buses & coaches	3,237	2,754	20,517	17,652
Trams & trolleybuses	767	757	5,193	5,269
	5,409	4,751	35,213	31,539
British Road Services—				
Freight charges, etc.	5,909	6,195	41,624	40,528
Road Passenger Transport	4,327	3,959	23,897	21,745
Docks, Harbours & Wharves	1,328	1,161	8,528	7,087
Inland Waterways	164	164	1,200	1,037
Hotels & Catering	1,370	1,367	8,443	8,297
Total	52,632	50,896	339,566	312,765

LONDON TRANSPORT

	Passenger journeys	Inc. or dec. per cent. over 1951	Car miles	Inc. or dec. per cent. over 1951
Railways	000	000	000	000
Buses & coaches	42,599	-10.7	16,854	-7.3
Trams & trolleybuses	227,810	-2.2	27,476	+4.1
	61,327	-18.7	6,196	-17.5
Total	331,736	-6.8	50,526	-3.0

INLAND WATERWAYS

Tonnage of traffic and ton miles

	Tonnage	Inc. or dec. per cent. over 1951	Ton miles	Inc. or dec. per cent. over 1951
Coal, coke, patent fuel & peat	000	000	000	000
Liquids in bulk	502	+7.6	6,832	-3.0
General merchandise	154	+4.3	3,890	-2.4
	311	-8.3	4,833	-6.4
Total	967	+1.4	15,555	-3.9

BRITISH RAILWAYS

Rolling Stock Position

	Operating stock	Number under repair	Available operating stock	Serviceable stock in 1951
Locomotives	18,919	3,000	15,919	15,818
Coaching vehicles	57,681	4,681	53,000	53,036
Freight wagons	1,122,308	87,866	1,034,442	1,038,675

BRITISH RAILWAYS

Passenger Journeys (Month of May, 1952)

Full fares	Excursions, cheap day, etc.	Other descriptions	Early morning and workmen	Season tickets	Total	Inc. or dec. per cent. over 1951
14,697,000	22,694,000	4,481,000	18,305,000	16,432,000	76,609,000	-4.2

BRITISH RAILWAYS

Freight Tonnage Originating and Estimated Ton-Miles (Period No. 7)

	Merchandise	Minerals	Coal & coke	Livestock	Total	Inc. or dec. per cent. over 1951
Tons originating	000	000	000	000	000	
Ton-miles	3,808	4,773	13,052	48	21,681	+1.6
	510,616*	389,134	783,513	—	1,683,313	-2.5

* Includes livestock

BRITISH RAILWAYS (Period No. 7)

	Total steam coaching train-miles	Total electric coaching train-miles	Total freight train-miles	Freight train- miles per train engine-hour	Net ton-miles per total engine-hour	Locomotive coal consumption	
						Total tons	Lb. per engine-mile
1952	15,438,000	3,857,000	10,790,000	9.1	611	994,000	58.3
1951	15,674,000	3,835,000	10,265,000	8.7	604	1,018,000	58.8

London Transport Garston Bus Garage

New equipment for country services

With the closing of the Leavesden Road garage at Watford, the new L.T.E. bus garage for Country Buses and Coaches at Garston, North Watford, has become operational, although the installations there are not yet fully completed. The Garston garage comprises three main buildings: the operating and welfare block, placed on the main road frontage, a covered bus parking area at the rear of the site and, between them, the dock. A private road between the office block and the dock serves as a terminal road for turning buses without their having to enter the parking area, allows vehicles to enter the dock from the street and, at the same time, provides light and air to the offices, canteen and workshops.

Long private access roads have been provided to serve as "reservoirs" for vehicles going into or coming out of service; these "reservoirs" are of considerable value in obviating congestion of the public highway, particularly at night when buses tend to arrive in groups.

An unobstructed floor area of 45,400 sq. ft. is provided to accommodate 150 buses. At the entrance to the parking area service lines are provided for vacuum cleaning, washing, re-fuelling, and oiling vehicles as they come out of public service. A range of buildings adjoining these lines include a machine room, housing fuelling and oil pumps and air compressors, staff drying and locker rooms and lavatories, and a high-pressure steam cleaning unit in which rams are provided to raise vehicles to a suitable height for the application of steam jets to the chassis. Underground fuel oil storage (totalling 25,000 gallons) has been provided in the open, contained in five vertical cylindrical tanks. This installation, designed by the road service engineers, is unique.

After servicing, vehicles are parked in pre-arranged positions ready for proceeding in'o service the next morning. In the parking area "running shift" and "rota" pits are provided adjacent to the dock for minor inspection and adjustments not justifying the transfer of vehicles to within the dock itself. Ten pits are provided in

the dock, five for heavy overhauls (including engine removal when necessary) and five for secondary overhauls. Around the pits are the workshops, stores, offices for staff, lavatories, first-aid room, and so on.

The operating and welfare block provides for officials and staff functioning not only for this garage but also for attached subsidiary garages; traffic offices for the issue of tickets and receipt of cash; public inquiry and lost property offices; duty notice room; canteen with seating accommodation for 160; recreation room with billiard table and other indoor game facilities; and staff locker room and lavatories.

The buildings are steel-framed with brick walling, faced with Leicester straw and Bucks multi-colour facing bricks. Artificial stone dressings have been provided around the windows and doors and on parapets. The parking area roof spans 170 ft. with the main girders generally at 60 ft. centres; the end bays are 43 ft. wide. Subsidiary lattice girders at 50 ft. centres span between the main girders on which bear steel purlins for Universal reinforced asbestos troughing. The main roof lighting is provided by lantern lights 10 ft. wide spanning almost the full width of the garage and parallel to the main girders.

Servicing Equipment

The garage is provided with the most modern equipment for servicing. Vacuum cleaning of buses is effected by plant supplied by the British Vacuum Cleaner & Engineering Co. Ltd., which can be used by from four to twelve operators simultaneously. Two Essex machines wash the backs and sides of buses. Three Ingersoll Rand compressors provide compressed air service, and there is a steam-cleaning plant comprising a Tecalemit 10-ton hydraulic lift and Weaver gas-fired steam jenny. A Wayne Smith high-lift pump and recording meter are used in conjunction with the refuelling tanks. In the battery charging room, batteries are handled to the charging points over a roller runway made up of Light Steelwork rollers on roller bearings, enabling them to be moved with a touch of the finger. The

Hewitt rectifier plant is installed outside the room. Fluorescent lighting is installed in the parking area, dock, operating, and district offices.

Western Region Winter Trains

An announcement by the Western Region says that faster trains to and from London and on cross-country routes will be the principal feature of the winter train service, which will operate from Monday, September 15, until June 7, 1953.

Compared with the 1951-52 winter service, eleven weekday and four Sunday trains will be speeded up by from 10 to 27 min. These include the "Cornish Riviera Express," 10.30 a.m. Paddington to Penzance and 9.45 a.m. Penzance to London daily, the running times of which have been reduced by 15 and 20 min., respectively.

Other through express services which will be accelerated are:—

	Acceleration (Min.)
4.35 p.m. Weston-super-Mare to Paddington	15
8.30 a.m. Plymouth to Paddington	10
11.10 a.m. Millford Haven to Paddington	15
6.30 a.m. Birkenhead to Paddington	10
7.30 a.m. Shrewsbury to Paddington	10
2.35 p.m. Shrewsbury to Paddington	10

"The Cornishman," which was introduced at the beginning of the summer service, will continue to run each weekday, leaving Wolverhampton at 9.15 a.m. for Penzance, and at 10.30 a.m. from Penzance for Wolverhampton, the schedules showing an improvement in journey time of 27 and 17 min. respectively as compared with the corresponding services last winter.

The 8.30 a.m. through train from Cardiff to Newcastle, which was introduced on weekdays with the summer service, will continue to run throughout the winter. On Sundays, services from the West of England and South Wales to Paddington and from South Wales to the North have also been accelerated, and an advertised train will be run at 8 p.m. from Paddington to Great Malvern, calling at Reading, Oxford, Kingham, Moreton-in-Marsh, Honeybourne, Evesham, Pershore, and Worcester.

E.R. Winter Train Services

The Eastern Region has announced the principal alterations in its winter train services, which will come into operation on Monday, September 15, and will continue until further notice. Seasonal named trains to be withdrawn are the "Capitals Limited" (9.35 a.m. Kings Cross to Edinburgh); the "Scarborough Flyer" (11.20 a.m., F.S.O., Kings Cross to Scarborough and Whitby); the "Easterling" (10.33 a.m., S.O., and 11.3 a.m., S.X.) Liverpool Street to Yarmouth South Town and Lowestoft Central, and 7.10 p.m. Yarmouth South Town and Lowestoft Central to Liverpool Street; and the "Norseman" boat train for Bergen Steamship Company's passengers only, 9 a.m. Kings Cross to Newcastle Tyne Commission Quay.

A new express service will be introduced between London Kings Cross, Leeds Central and Bradford Exchange on Mondays to Fridays, as reported last week. Leaving Kings Cross at 8 a.m., the down train will call at Hitchin at 8.41, Doncaster at 10.48, and reach Leeds at 11.31 a.m. and Bradford at 11.55 a.m. The up train will leave Bradford at 6.10



Bus at a servicing point in the new L.T.E. Garston garage

p.m., Leeds at 6.33, Doncaster at 7.13, and reach Hitchin at 9.21 p.m. and Kings Cross at 10.5 p.m. Refreshment car facilities will be provided on this service.

On the Eastern section the down "Broadman" will be accelerated to a timing of 2 hr. between Liverpool Street and Norwich. The up train will undergo a slight acceleration, making additional stops and being timed to reach Liverpool Street at 10 a.m. instead of 10.7.

Amendments to other services will be as published in the winter timetable shortly to be issued and as indicated in notices at stations. These alterations include a modification to the interval service between Liverpool Street and Clacton on similar lines to last year.

Winter Services, N.E. Region

Main features of North Eastern Region winter train services from September 15 will be the speeding up of many trains as compared with last winter's timetable, and the running of the two new businessmen's express trains between Bradford and London.

There will be accelerations of from 15 to 20 minutes in five Bradford Forster Square-St. Pancras services as compared with last winter. The 9.5 a.m. "North Briton" from Leeds to Glasgow will be speeded up by 11 min., and accelerations of other services over the previous winter timetable will range up to 32 min.

The 6.18 p.m. Kings Cross to Leeds, Bradford, and Hull will reach Leeds Central 17 min. earlier, Bradford Exchange 19 min., and Hull 18 min. earlier than the previous winter.

The summer service train which leaves Liverpool Lime Street on Sundays at 6.35 p.m. for Leeds City will run throughout the winter, and the 5 p.m. Newcastle to Manchester Exchange on Sundays will be extended to Liverpool Lime Street, arriving there at 10.27 p.m. The summer Sunday service on the North Tyneside electrified lines will remain in operation until October 5.

COAL OUTPUT HIGHER.—Total saleable output of coal for the week ended August 30 was 4,254,500 tons, compared with 4,206,800 tons in the previous week. Production for the 35 weeks of this year totals 148,753,400 tons.

Scottish Region Station Improvements

Passenger station improvements in the Scottish Region at Haymarket (Edinburgh), Newton-on-Ayr (Ayrshire), Cokerhill (Glasgow), and Mossbank West (Glasgow), costing approximately £55,000, have recently been authorised. At Haymarket, the improvements include remodelling at the station entrance by modernising the booking office and providing a new parcels office and bookstall directly accessible from the booking hall. A new train departure indicator will be provided beyond the booking hall on the site occupied by the existing bookstall. Alterations are also to be made to the platform buildings to provide improved waiting facilities.

The work to be undertaken at Newton-on-Ayr includes the removal of existing station buildings on the Ayr-Girvan-Stranraer departure platform and the erection of a new building to incorporate a combined booking and parcels office, booking hall, waiting room, and other facilities; the redecoration of the existing buildings on the Troon-Paisley-Glasgow departure platform; and improvements in lighting.

The present station buildings at Cokerhill and Mossbank West, busy suburban stations on the Glasgow St. Enoch-Paisley Canal line, are to be replaced with new buildings designed to incorporate the latest standards of booking office facilities, modern waiting room accommodation, and up-to-date electric lighting. At Cokerhill the provision of an additional access to the station from Cokerhill Road is also planned.

The alterations and improvements are part of the British Railways long-term policy of modernisation of station premises. Work at Haymarket Station is expected to begin in the autumn; the other projects will be begun as quickly as conditions of labour and materials permit.

Self-Tipping Wagons for Germany

Four-bogie, eight-axle, self-tipping wagons of standard gauge have been supplied by the Fried. Krupp Lokomotivfabrik, Essen, for the German brown coal industry, which is working seams at considerable depths, and where rapid tipping of large quantities of over-burden is needed and sharp curves are prevalent.

Another design of tipping wagon for this work, by Orenstein-Koppel and Luebcker Maschinenbau, was described in our June 6 issue.

As the body is supported eccentrically, tipping occurs automatically as soon as retaining bolts and a locking mechanism are loosened. The body tips over to an angle of 50 deg. and automatically locks itself in that position. When this second lock is released the body regains its normal position by its own weight. A compressed-air tipping cylinder is fitted vertically at each end of the wagon to deal with badly distributed loads, and even with the effects of some of the poor tracks on the industrial lines; when it is used the compressed air operates the locking devices also. The body is welded into one piece, and has a carrying capacity of 96 cu. yd., or about 95 tons.

The empty weight of one of these wagons is about 48 tons, and the fully laden weight 150 tons or more according to whether the load is levelled or heaped; the individual axleload is thus 19 tons or more. The overall length is 45 ft. Air and hand brakes are included, with different settings for empty and loaded conditions, and there are blocks on all wheels.

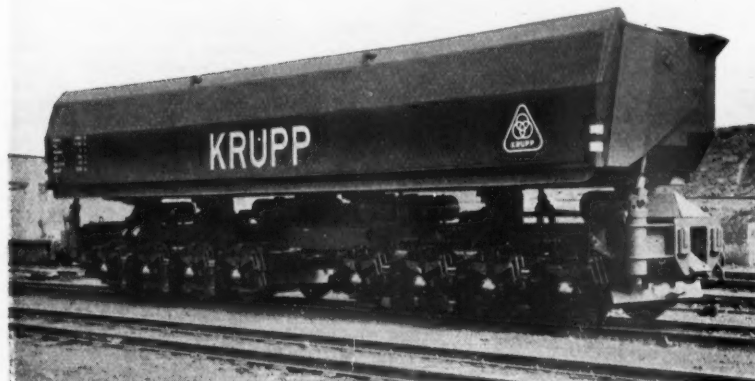
Developments in the Frankfurt Division, German Railways

In a recent review of operations and work in hand on the Frankfurt Division of the German Federal Railway by the Divisional Manager, Herr Hess, quoted in the *Frankfurter Neue Zeitung*, attention was drawn to the problem of daily workmen's services. Changed residential conditions had caused a surprising increase in the numbers travelling to and from their place of work by railway. A new type of coach to permit quick loading had been designed, and 500 of these were on order. It was hoped that some of them would be in service at the end of the year. Each coach would cost about DM. 150,000, so that about 7½ million DM. would be needed for this one item. The difficulty of raising capital, therefore, was one of the main obstacles in the work of eliminating traffic bottlenecks.

At present, energies were concentrated on re-glazing the roof of Frankfurt Main Station. The ever-increasing needs of the Rhein-Main industrial area were to be met by a great increase in the extent of the facilities now available. It was intended to provide new trackage, shunting humps, and all-electric signal boxes, all of which will speed up the handling of goods traffic.

Trials at Wiesbaden with radio-telephony between yard staff and the crews of shunting locomotives had been successful, and it was intended to install this system at Frankfurt. Modernisation of existing signalling equipment was proceeding at a satisfactory rate. Colour-light signals would replace semaphore signals.

The plan to provide a shuttle service of modern diesel trains between Frankfurt Airport and the Main Station was also progressing. Herr Hess stated that in the meantime discussions had taken place with the Federal Minister of Transport, and that agreement in principle had already been reached. The Federal Postal Authorities were also interested in this plan. The line would run from the Main Station to the Airport via Schwanheim and Unterschweinstiege. Passengers arriving by air



Tipping wagon for brown coal transport in Germany

would thus have a convenient connection with the whole of the Federal Railways. A Customs office for the clearing of passengers' luggage at the Main Station was also envisaged.

Dealing with staff questions, the Divisional Manager stated that there was no reason to be dissatisfied with the numbers of young men wishing to enter the traffic branches of railway service. The situation among the clerical staff, however, was causing more concern. This was due entirely to low remuneration, and it was intended to grant an increase in pay to the lower grades, many of whom were already assuming heavy responsibilities.

Electricity and Productivity

The electricity supply industry was the first nationalised industry to send productivity teams to the United States. A generation team and a distribution team travelled together and were in the United States during November and December, 1949. Their report has now been considered in detail.

Nearly every productivity team has commented on the high amount of electric power available per worker in the United States; as the electricity teams remarked, American industry "uses three times as much electricity per worker as does industry in Britain."

Among the teams' suggestions was the recommendation that "the delay involved in the choice of a site for a new station should be by some means considerably lessened." A major cause of delay has been the need to get the approval of numerous Government departments and other bodies to the sites chosen for power station development.

The comments of the teams concerning the use of power-driven tools have been widely welcomed. "Every endeavour is made to take the tools to the job rather than the reverse and to develop special tools if necessary." Since the teams drew attention to the pneumatic impact nut wrench, it has become one of the most popular tools in the industry.

Distribution of electricity is specifically the concern of the Area Boards. The main comments and suggestions of the team on distribution concerned standards of continuity of supply, the need for detailed statistical records, the use of high-speed automatic switchgear, preventive maintenance, mechanical hole boring, the use of poles jointly for power and communication circuits, radio communication for maintenance personnel, and outdoor meters.

Staff & Labour Matters

Engineers' Wage Claim

The Management Board of the Engineering Employers' Federation reaffirmed on August 28 the view of the Employers' Negotiating Committee that the claim of the C.S.E.U. for a wage increase of £2 a week was unjustified. In a letter to the Confederation, the Board stated that, if conceded, the increase would inflict grave damage on the industry and on sales at home and abroad, with adverse effects upon employment and supplies of food and raw materials. It could make no alternative offer because any general wage increase would be against the national interest.

In response to this, leaders of the C.S.E.U. decided on August 31 by an almost unanimous decision to recommend

to the unions to stop all overtime and piecework in protest. Mr. H. G. Brotherton, Chairman of the C.S.E.U., said that his executive council had noted that the employers were not in principle prepared to grant any general increase. This was a challenge not only to the affiliated unions but to the trade union movement as a whole. The recommendation will be considered at a meeting in York on September 10 of all the executives of the Confederation. Many engineers concerned in the claim are pieceworkers, so that any ban on piecework would seriously affect production.

Arbitration Proposed

The executive of the National Union of General & Municipal Workers, a component of the C.S.E.U., announced on September 3 at Margate, where the T.U.C. is holding its annual congress, a decision at variance with that reached by the majority of the C.S.E.U. executive on August 31.

Mr. T. Williamson, General Secretary of the N.U.G.M.W., said that his executive believed that the wage dispute with the engineering employers should be referred to the Minister of Labour for arbitration. The employers' repeated refusal last week to consider granting any wage increase, he said, was an encouragement to "unruly elements" whose only aim was to cause chaos and disruption. The union regarded the employers' attitude as most unfortunate and not in the interests of the industry, and appealed to them to reconsider it.

Railwaymen and the C.S.E.U.

Many railwaymen are members of unions affiliated to the C.S.E.U., but the N.U.R. claims that by far the most railway workshop staff are members of the N.U.R. Railway workshop staff are not directly concerned in the C.S.E.U. claim for an increase of £2 a week, as, through the medium of the employees' side of the Railway Shopmen's National Council, on which both the C.S.E.U. and N.U.R. are represented, they have submitted a separate claim for a substantial pay increase. This was declined by the Railway Executive at a meeting of the R.S.N.C. on July 23. Under the negotiating procedure

the next stage would be for the claim to be referred to the Industrial Court, but so far, no further action has been taken by the employees' representatives.

Wages Council Orders

Increases recommended by four wages councils and which were referred back by the Minister of Labour, Sir Walter Monckton, for reconsideration by the Councils, have now been confirmed by the Minister. After reconsideration all four councils reiterated their original proposals. The orders come into effect on September 19 and raise minimum rates for retail food, drapery, and certain other shop workers in England and Wales.

Contracts & Tenders

The Canadian National Railways have placed a \$2,300,000 order with the Canadian Car & Foundry Co. Ltd. for 18 motor coaches and trailers for use on electric suburban services at Montreal.

The Commonwealth Railways of Australia have placed a contract with the Gregg Car Co. Ltd., Belgium, for the supply of bodies and underframes for 197 bogie wagons of the following types, to be used on 3 ft. 6 in. gauge lines:—

- 60 cattle wagons
- 50 covered goods wagons
- 75 open goods wagons
- 12 sheep wagons

The Special Register Information Service of the Board of Trade has reported a call for tenders issued by the Central Trust of China for the supply of three diesel locomotives for the 2 ft. 6 in. (762 mm.) gauge in Formosa. Tenders should reach the Central Trust of China, United States Aid Division, 96 Po Ai Road, Taipei, Taiwan (Formosa), by 10.30 a.m. on October 8. A copy of the tender documents is available for inspection at the Board of Trade, Commercial Relations & Exports Department, by representatives of United Kingdom manufacturers. A further copy is available on loan in order of written application; reference CRE/29945/52 should be quoted.

Great Northern Railway (Ireland) Day Tours



Great Northern Railway (Ireland) window display in Dublin advertising day tours from the city by train and bus. The form of construction allows the height to be adjusted and the photographs to be changed to suit the theme of the display

Notes and News

Vacancy for Boiler Inspector.—Applications are invited for the post of boiler inspector, Nigerian Railway, for one tour of 18-24 months in the first instance. See Official Notices on page 279.

Special Services for Highland Gathering.—In connection with the Cowal Highland Gathering at Dunoon on August 30, the Scottish Region arranged twelve special sailings to and from Dunoon. Six of the special sailings were from Gourock to Dunoon; five from Dunoon to Gourock; and one from Dunoon to Craigendoran. Many relief trains were run between Glasgow and the coast railheads.

Fare Stages to be Marked on L.T.E. Road Services.—London Transport has decided to mark the fare stage points on its road services. Work began on August 31 and is



New fare stage notice added to a standard bus stop sign

being pressed forward speedily. The method of indicating the stage on a bus stop sign is shown in the accompanying illustration.

Alternative Rail and Road Facilities in Hull.—In collaboration with East Yorkshire Motor Services, British Railways on September 1 introduced a scheme in the Hull area which allows cheap day rail tickets to or from Hull to be used on bus services on the return journey; and for return bus tickets to or from Hull to be used by rail, without extra charge. Places to benefit by this interchange of services are Brough, Beverley, Hornsea Town, and Withernsea.

Loan to Colombia.—The International Bank for Reconstruction & Development has announced a loan to Colombia of \$25,000,000, for the purpose of financing construction of a 235-mile railway in the Magdalena River Valley and railway workshops in Bogota.

Awards for Technical Papers at Pan American Railway Congress.—Awards for railway technical papers to be presented at the eighth Pan American Railway Congress which, as recorded in our August 29 issue, will be held in Washington and Atlantic City next June, have been announced. The Eric V. Hauser Memorial Award of \$1,000 for the paper judged to be "the most helpful to the science of railroading in respect to way and struc-

tures" has been offered by Mr. William T. Faricy, President of the Association of American Railroads and Chairman of the United States National Commission in the Pan American Railway Congress Association. Three prizes totalling 50,000 pesos (about \$3,600) for the authors of papers on railway subjects have been offered by the Argentine Government. The Pan American Railway Congress Association has also established an award of 25,000 pesos (approximately \$1,800) and a gold medal for the paper which is of the most positive benefit towards the operation and economy of railways.

Institution of Locomotive Engineers: Charles S. Lake Award.—The Council of the Institution of Locomotive Engineers has decided that the capital sum of £250 presented by the Directors of *The Railway Gazette* in 1943, in memory of the late Charles S. Lake, which had supported the Library Fund since that date, should support a new award, valued at £10, the Charles S. Lake Award. Mr. Charles S. Lake was a member of the editorial staff of *The Railway Gazette* from 1917 to 1942, and latterly an Associate Editor. Permission to make this change has been obtained from the Directors of *The Railway Gazette*. The award is made at the discretion of the Council, annually or otherwise, to the author of a meritorious paper presented and read at the headquarters of the Institution during any session and subsequently published in the *Journal* of the Institution.

Illinois Central Dividend Increased.—The directors of the Illinois Central Railroad Company have voted a dividend of \$1 a share on the common stock of the system for the third quarter of 1952. This represents an increase from the quarterly payment on the common stock of 75 cents a share authorised for each of the first two quarters. The 75-cent quarterly payment had been in effect since July 1, 1950, when dividend payments were resumed. In announcing the action taken by the board of directors the President, Mr. Wayne A. Johnston, said that the increase was made possible by favourable earnings so far in 1952.

Special Trains for Blackpool Illuminations.—Public demand to see the Blackpool illuminations this year is necessitating the running by British Railways of 537 special day, half-day and evening excursion trains to Blackpool between September 4 and October 20. This is the biggest number of special trains ever arranged to these illuminations, which this year utilise material valued at more than £300,000, and will cost the Corporation £70,000. The trains are being run from Lancashire and Yorkshire towns, South and North Wales, London, the Midlands, the North East Coast and Scotland.

Reorganisation of Krupp Combine.—The plans of the Allied Governments for reorganisation of the Friedrich Krupp industrial combine include release of part of it to Herr Alfried Krupp, a descendant of the founder of the firm. The Krupp properties are to be divided into four categories; the Rheinhausen steel plant, and a group of coal mines, with ore fields attached; the remaining coal mines, which produce 5.5 million tons a year; two engineering firms; and the rest of the property. The first group is to be taken out of Krupp control against a possible D.M. 193 million worth of bonds and shares plus coal royalties and proceeds of sale of ore fields. The coal companies in the

second group will be sold outright. In both these groups the ordinary shares are to be sold within five years and the non-voting bonds may be retained. The two engineering companies will be made over entirely to members of Herr Alfried Krupp's family. The remaining properties will remain in the full possession of Herr Krupp.

British Railways Coal, Iron and Steel Carrying.—British Railways carried 197,448 tons of iron and steel during the week ended August 23—the highest figure for two months. Coal cleared by rail during the week ended 6 a.m. on Monday, September 1, amounted to 2,942,050 tons, compared with 2,900,680 tons the previous week.

Goods Train Breakaway.—The brakes failed on a goods train near Garngad, Scottish Region, on August 26; the train ran on out of control with the crew on board, but was diverted into Glasgow High Street goods yard, where it collided with stationary wagons. Two men working on the wagons were injured.

New Passenger Facilities at Southampton.—A new terminal and reception hall has been completed at Southampton to handle increased passenger traffic resulting from sailings of the new liner *United States*. Some 12,000 passengers a month are expected to pass through the hall. It has an area of 360 sq. yd., laid with Vinyl tiles by Semtex Limited in collaboration with the architect, Mr. C. B. Dromgoole, of the Docks & Inland Waterways Executive.

Portable Air Compressor.—A new portable air compressor, Type "S.V.78," has been introduced by Broom & Wade Limited. The compressor delivers 60 cu. ft. of free air per min. at 100 lb. per sq. in. pressure when running at 1,500 r.p.m. It is driven by a Perkins "P.3" diesel engine developing 25 b.h.p. The unit is provided with tool boxes, and is mounted on two pneumatic tyred wheels. A unit of this type will be shown on the company's stand at the Public Works & Municipal Services Congress & Exhibition to be held at Olympia from November 3 to 9.

Antofagasta (Chili) & Bolivia Railway Co. Ltd.—Net receipts for 1951, after deducting a loss of £154,709 on working the lines of the Bolivia Railway Company, and other deductions, were £925,569, against £391,093 in 1950. This increase arose mainly from the greater traffic hauled and higher tariffs. Working expenses were approximately 79 per cent. of gross receipts. After adding £467,264 brought forward, and deducting fixed charges and appropriations, the balance is £448,551. Appropriations include payment of arrears of dividend on the 5 per cent. cumulative preference stock for 1942 and 1943.

Cuban Railway Reorganisation.—The Cuban Embassy in London has issued the text of a notice, signed by the Minister of Communications & Transport of the Cuban Republic, relating to the United Railways of Havana. Those interested are asked to submit by September 10 proposals for the purchase, reconstruction, and operation of the United Railways. The proposals will be considered by the Reorganising Commission of the United Railways of the Havana, which will report on them to the President of the Cabinet, recommending that which should be preferred. When it is known

THE RAILWAY GAZETTE

OFFICIAL NOTICES

The engagement of persons answering Situations Vacant advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

ASSISTANT DISTRICT ENGINEER (CIVIL) required by British Railway Company operating in Chile and Bolivia. Only men with Railway experience should apply. Applications with full particulars, qualifications, training and experience by letter to—Box 6149 c/o CHARLES BARKER & SONS LTD., 31, Budge Row, London, E.C.4.

REQUIRED. Superintendent for large Boiler Shop in India engaged manufacture locomotive boilers. Must have knowledge all stages boiler construction including welding and have had charge of large up to date Boiler Shop. Age between 35 and 48. Good pay and prospects for suitable candidate. Write stating age, present emoluments and salary required to—Box 6139 c/o CHARLES BARKER & SONS LTD., 31, Budge Row, London, E.C.4.

N.E.R. HISTORY.—Twenty-Five Years of the North Eastern Railway, 1898-1922. By R. Bell, C.B.E., Assistant General Manager, N.E.R. and L.N.E.R. Companies, 1922-1943. Full cloth. Cr. 8vo. 87 pages. 10s. 6d.—The Railway Gazette, 33, Tothill Street, London, S.W.1.

BOUND VOLUMES.—We can arrange for readers' copies to be bound in full cloth at a charge of 25s. per volume, post free. Send your copies to the SUBSCRIPTION DEPARTMENT, Tothill Press Limited, 33, Tothill Street, London, S.W.1.

that the proposal has been approved by the United Railways of the Havana & Regla Warehouses Limited and subsidiary companies, the Government will proceed to negotiate finally with all parties concerned.

Road Accidents in June.—Road casualties in June totalled 19,360, 389 less than in June, 1951. The decrease was mainly in the numbers of killed and seriously injured; the killed numbered 382, a decrease of 23, and the seriously injured 4,508, a decrease of 221. In the first six months of 1952, road accidents caused 95,157 casualties, of which 2,090 were fatal; this is an improvement on the same period last year, when there were 2,060 more casualties and 248 more deaths.

Developments in Packaging Methods.—Many new developments in packaging, on which Great Britain is now estimated to spend over £300 million a year, will be shown for the first time at Olympia (London) from January 20-30, 1953, at the Third National Packaging Exhibition. The latest machinery, British and foreign, will be on view. There will be about 200 exhibitors.

D.T.A. Requirements for 1953.—The Defence Transport Administrator, Mr. James K. Knudson, has announced requirements for the Railroad Transport and Inland Water Transport Divisions of the Defence Transport Administration of the U.S.A. for the first quarter of 1953. On behalf of the railway industry, the administration has claimed 31,500 wagons (other than tank wagons), 1,500 tank wagons, 100 passenger train cars, 936 locomotive units, and 450,000 tons of new rail.

Transport Reorganisation Proposals.—In a speech at Margate on August 31, Mr. Herbert Morrison said that the Government's transport policy was bad in itself, was mischievous from the point of view of the public interest, and was an irrelevant

GOVERNMENT OF PAKISTAN

MINISTRY OF COMMUNICATIONS

(RAILWAY DIVISION)

TENDER NOTICE.—52/1860/1/S. Tenders are invited for the supply to the North Western Railway, of

- 30,375 long tons (of 2,240 lb.) Medium Manganese Steel Rails 90 lb. "R" Flatfooted 42 ft. long complete with fishplates, fishbolts with nuts, dog-spikes, roundspikes, bearing plates and cast iron anchor plates, and
- 922 long tons (of 2,240 lb.) Medium Manganese Steel Rails 75 lb. "R" Flatfooted 42 ft. long complete with fishplates, fishbolts with nuts, dog-spikes and roundspikes.

Tender documents including instructions to tenderers, tender form, schedules of requirements, specifications, drawings and standard conditions of contract can be obtained from the office of the Director General Railways, Railway Division, Ministry of Communications, Karachi; General Manager, North Western Railway, Lahore; General Manager, Eastern Bengal Railway, Chittagong; High Commissioners for Pakistan in London, Room 115, 39/40 Lowndes Square, London, S.W.1; Ottawa and New Delhi; Embassies of Pakistan in Washington, Paris, Brussels and Bonn on payment of £10 for each set, which amount will not be refunded.

Tenders in sealed covers superscribed "Tender for Rails complete with fittings" should be submitted direct to the DIRECTOR GENERAL RAILWAYS, MINISTRY OF COMMUNICATIONS, RAILWAY DIVISION, GOVERNMENT OF PAKISTAN, KARACHI, so as to reach him before 11 hours on October 9, 1952, at which time and date tenders will be opened in the office of the Director Mechanical Engineering and Stores, Railway Division in the presence of any tenderers who may care to be present.

The Director General Railways reserves to himself the right to reject the lowest or any tender without assigning any reason therefor and may accept any tender in part or in whole.

This call is being made simultaneously in Pakistan, Belgium, Canada, France, West Germany, India, U.K. and U.S.A.

diversion of effort from the constructive consideration of our economic difficulties, the solution of which was vital to our national well-being. If effective co-operation and integration in transport were to be achieved, there must be a unification of ownership, and the question was whether such unified ownership should be public or private. If the policy of complete unification based on private ownership was adopted, there would be widespread public apprehension. Any Government which adopted it would have to accompany such a policy with an extensive and elaborate system of State supervision and regulation of some sort. The alternative, unification of ownership on the basis of a publicly owned concern, could enjoy, because it was a public concern, a large degree of freedom in day-to-day management.

Heavy Traffic at Southampton Docks.—On August 29 the port of Southampton experienced the heaviest passenger traffic in one day this year. More than 5,000 travellers passed through and 14 special boat trains arrived from Waterloo as well as the normal services. Extra immigration officials were sent to the port to help in handling the rush of traffic.

Aberdeen Transport Department Deficit.—The plans of the Aberdeen Transport Department for dealing with a deficit of some £92,000 in 1951-52 and an anticipated deficit of £64,000 next year, provide for reductions in tram and bus frequencies, higher fares, and a 20 per cent. increase in the price of season tickets. The chief alteration in fares recommended is an increase in the minimum fare from 1½d. to 2d. During the winter months the tram and bus services are to stop earlier than in recent years.

Safe Driving Awards for Scottish Railway Staff.—In the annual competition promoted by the Royal Society for the Prevention of Accidents, nearly 1,200 awards have been gained by carters and motor drivers of the Scottish Region in respect of the

CROWN AGENTS FOR THE COLONIES

BOILER INSPECTOR required by the Nigerian

Government Railway for one tour of 18 to 24 months in the first instance. Commencing salary according to age and war service in the salary scale shown which include Expatriation pay and temporary increase, either (a) on temporary terms in scale £777 rising to £926 a year or (b) with prospect of pensionable employment in scale £711 rising to £860 a year. Outfit allowance up to £60. Gratuity of £100 a year payable to temporary officers under (a) only on satisfactory completion of final service. Free passages for the officer and his wife and assistance towards the cost of children's passages or maintenance in this country. Liberal leave on full salary. Candidates between 28 and 40 years must have served an apprenticeship in a Boiler shop of a Railway Workshop or Boiler Repair Shop and have had at least 7 years subsequent experience as a journeyman, chargehand or inspector on Locomotive Boiler repairs including at least three years in the Running Sheds. They should be capable of supervising the work of African Boiler-making staff and of submitting a detailed report on the condition of a Locomotive or Pump Boiler.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper to the CROWN AGENTS FOR THE COLONIES, 4, Millbank, London, S.W.1, quoting on letter M.33173A. Applicants now serving with the British Railways would be eligible for secondment and should apply through their local officers. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration.

RAILWAY MAINTENANCE PROBLEMS. By

H. A. Hull (late District Engineer, L.M.S.R.). Valuable information. With much sound advice upon the upkeep of permanent way. Cloth. 84 in. by 5½ in. 82 pp. Diagrams. 5s. By post 5s. 3d. The Railway Gazette, 33, Tothill Street, London, S.W.1.

year 1951. Among the awards gained by British Railways staff are 349 medals and bars, including eleven medals for 15 year's, and twenty-five bars for 16 year's, accident-free driving. Over 1,800 members of British Railways staff in Scotland were entered in the competition, the object of which is to develop and encourage reliable, alert and courteous carters and motor drivers whose aim is complete freedom from accident.

New Line in Northern China.—The former Lung-Hai Railway in northern China has been extended some 225 miles from Tien-shui, a port on the River Wei-Ho, to Lanchow. The extension is wholly within the province of Kansu. It is reported that work has been in progress for some time on a further extension through Kansu and Sinkiang to Sergiopol (Ayaguz) in the Soviet Union; this line would serve Tihwa (Urumchi), capital of Sinkiang. There are oilfields in north-west Kansu and similar developments in Sinkiang were the subject of a Russian-Chinese agreement in 1950.

Reduced Air Fares in Scotland.—Fares on British European Airways internal Scottish routes are to be cut by an average of one-fifth throughout the winter, beginning on October 1. The cut is to encourage potential air travellers in the outlying areas of Scotland to visit the cities. The resultant increase in traffic, it is stated, would mean a more economical use of aircraft. Proposals to reduce fares on the Glasgow-London and Edinburgh-London routes are also under consideration.

Leith North Goods Station.—The Scottish Region announces that on and from September 19, Leith North (L.M.S.) Goods Station will be closed for general traffic, but traffic for traders with warehouse accommodation at the station, and truck loads of empty fish boxes consigned to fish merchants in Leith, Newhaven, and Granton, will continue to be dealt with at the station. Traffic in less than wagon loads collected by British Railways cartage ser-

vices will be put on rail at Lothian Road, or Leith Walk East, and inwards traffic will be delivered direct from the station of arrival in Edinburgh. Sundry consignments for despatch will be accepted at Leith Citadel Station. Full wagon load traffic carted by British Railways vehicles will be concentrated at Leith South (L.N.E.) Goods Depot; and similar traffic carted by traders will be dealt with at Leith South (L.N.E.), or other goods depot in the district.

San Paulo Repayment Proposal.—At an extraordinary meeting of the San Paulo (Brazilian) Railway Co. Ltd. to be held on September 30, the board is to propose a capital repayment of 3s. 4d. per 10s. stock unit. The repayment involves £500,000, and the Chairman points out that liabilities in Brazil include certain items at present the subject of dispute in the Brazilian courts; that a possible liability of about £100,000 arising from a claim by the Road Motor Company's employees has to be taken into account; that prolonged discussions on British income tax are still in progress; and that the statement to the High Court seeking a reduction of capital must show claims against the company at their full amounts.

Guildhall Banquet for Engineering Congress.—Delegates and visitors to the fourth congress of the International Association for Bridge & Structural Engineering (see also leading article this week) attended a banquet at the Guildhall, London, on September 1. Alderman Sir Frederick Michael Wells presided in the absence of Sir Leslie Boyce, Lord Mayor of London. Among the railway and railway-associated delegates to the congress who attended the banquet were:—

Belgium: Mr. V. Degreef, Engineer, Permanent Way Department, Belgian National Railways.

France: Messrs. Cambournac, Carpentier, Casse, A. Lazard, Ways & Works Department, S.N.C.F.

Great Britain: Dr. P. W. Abeles, Civil Engineer's Department, Eastern Region; Messrs. P. S. A. Berridge, Bridge Assistant, Western Region; W. P. S. Cockle, New Works Engineer's Office, L.T.E.; L. E. Hawkins, Assistant Civil Engineer (Structures), L.T.E.

Holland: Messrs. J. de Bruine, Netherlands State Railways, A. H. Foest, E. J. M. Harmsen, J. A. van der Breggen, N.J. van Veen.

Norway: Mr. A. Ledang, Norwegian State Railways.

Spain: Professor Domingo Mendizabal.

Sweden: Mr. J. Bjork, Chief Engineer, State Railways Board; E. Lundberg, S. Lillengren, S. Reni, State Railways Board.

Switzerland: Mr. L. Marguerat, Swiss Federal Railways.

Railway Stock Market

The upward trend in stock markets in evidence during the past two weeks received a moderate check after the opening of the T.U.C. Conference and the move by the engineering unions to ban overtime working. The latter affected sentiment, but there was little selling, though on the other hand, buyers were cautious and this was mainly responsible for the set-back recorded in British Funds and industrials earlier this week. With the beginning of the new Stock Exchange accounts buyers were more in evidence and markets showed signs of rallying. A good case can be made out for the view that British Funds are likely to record further good improvement over the next few months now another increase in the bank rate is considered improbable. Moreover, if British Funds show a good rise, this is bound to mean higher levels in other sections of markets, because investors who feel that the yields on gilt-edged stocks are too small for their requirements will tend to favour industrial and other higher-yielding securities. On the other hand, buying of industrial shares is likely to be selective and centred mainly on engineering and shares of other companies which appear to have reasonable prospects of maintaining dividend payments. Removal of controls and restrictions and growing competition both at home and abroad are bound to mean that a wide range of companies will have difficulty in keeping earnings at last year's rates.

Business in foreign rails has been on a moderate scale, but it is possible that, before long, activity in this section of markets will increase, because when the terms of the Japanese debt settlement are announced shortly, Japanese bonds will probably cease to monopolise attention among foreign securities. Antofagasta ordinary and preference stocks have been steady at 12½ and 56 respectively, and there was rather more business passing in Manila Railway debentures with the "A" at 82 and the "B" 71½, but the preference shares of the last-named company were easier at 9s. 6d. United of Havana stocks have again been quiet and the 5 per cent. debentures at 16½ lost part of an earlier improvement. Activity in White Pass & Yukon common shares remained a feature, and although best levels were not held,

the price at 16½ dollars was again higher on balance for the week, while the 5 per cent. convertible debentures changed hands around 63½, and the 4½ per cent. debentures were dealt in around 29½. Guayaquil & Quito 5½ per cent. bonds marked 29½ and Midland of Western Australia 4 per cent. second debentures 64½. Brazil Rail bonds were 6½. Mexican Central "A" debentures eased to 71½. Nitrate Rails shares were 19s. and Taltal have been steadier at 15s. Egyptian Delta 5 per cent. debentures were 49, Cordoba Central "B" debentures 31 and business has taken place up to 2 in Paraguay Central income debentures.

Costa Rica 6½ per cent. first debentures were quoted at 55½ and the 6½ per cent. second debentures at 35½; in other directions, Dorada Railway ordinary stock was 41½ and the 6 per cent. first mortgage debentures at 98½. Algoma Central first mortgage income debenture stock changed hands at 260 dollars. Canadian Pacific eased to 64 dollars, while the 4 per cent. preference stock was 65 and the 4 per cent. preference stock was 65 and the 4 per cent. debentures 79½. San Paulo 10s. ordinary units have been firmer at 11s. 3d. on the proposed capital repayment of 3s. 4d. per unit involving £500,000 which will reduce the capital to £1,000,000.

Steadiness was again shown by road transport shares, with West Riding at 32s. 6d., Southdown 74s. 6d., and Lancashire Transport 41s. B.E.T. deferred stock was higher on balance at £420.

Engineering and kindred shares lost a small part of recent gains, with Vickers at 46s. 1½d., Cammell Laird 5s. units 11s. 1½d., Babcock & Wilcox 70s. 9d., and Guest Keen 53s. 9d. Ruston & Hornsby were 38s. 6d., Tube Investments 58s. 6d., and T. W. Ward 71s. 9d. The market believes that most engineering companies have reasonable prospects of maintaining their dividends, and yields on this basis are generally not unattractive.

Beyer Peacock were 28s., Birmingham Carriage 33s. 1½d., Hurst Nelson strengthened to 48s. 9d., but North British Locomotive eased to 15s. 6d. Vulcan Foundry were 23s., Central Wagons 79s. 3d., Gloucester Wagon 10s. shares 12s. 6d., and North Central Wagons 4s. paid shares 12s. 9d., while Charles Roberts 5s. shares were 22s. and Wagon Repairs 5s. shares 11s. 9d.

Traffic Table of Overseas and Foreign Railways

Railway		Miles open	Week, or month ended	Traffics for week		No. of week	Aggregate traffics to date			
				This year	Inc. or dec. compared with 1950/51		Total	Increase or decrease		
							1951/52			
South & Central America	Antofagasta ...	800	22.8.52	£ 130,540	+	£ 9,240	34	£ 5,141,490	+	£ 1,120,380
	Costa Rica ...	281	July, 1952	cl.463,149	+	cl.90,299	4	cl.463,149	+	cl.90,299
	Dorada ...	70	July, 1952	35,813	—	1,898	30	235,527	—	15,944
	Inter. Ctl. Amer.	794	June, 1952	\$1,009,607	—	\$23,367	26	\$6,944,168	—	\$12,517
	Paraguay Cent. ...	274	22.8.52	G582,639	+	G218,099	8	G4,018,613	+	G1,354,628
	Peru Corp. ...	1,050	July, 1952	\$9,506,000	+	\$1,581,000	4	\$9,506,000	+	\$1,581,000
	" (Bolivian Section)	66	July, 1952	Bs.16,387,000	+	Bs.3,358,000	4	Bs.16,387,000	+	Bs.3,358,000
	Salvador ...	100	May, 1952	cl.53,000	+	cl.5,000	48	cl.899,000	+	cl.32,000
	Taltal ...	122	July, 1952	\$2,260,000	+	\$470,000	4	\$2,260,000	+	\$470,000
Canada	Canadian National†	23,473	July, 1952	18,575,000	+	893,333	30	128,910,000	+	11,476,000
	Canadian Pacific...	17,037	July, 1952	13,064,000	+	1,132,000	30	87,106,000	+	6,182,000
Various	Barsi Light* ...	167	July, 1952	44,155	—	11,670	17	124,140	—	29,610
	Gold Coast ...	536	June, 1952	266,795	+	19,579	12	918,158	+	112,909
	Mid. of W. Australia	277	June, 1952	52,966	+	9,338	52	690,910	+	193,202
	South Africa ...	13,398	26.7.52	1,942,635	+	43,259	17	33,007,005	+	1,340,742
	Victoria ...	4,744	Apr., 1952	2,010,674	+	217,273	43	—	—	—

* Receipts are calculated at 1s. 6d. to the rupee

† Calculated at \$3 to £1

Forthcoming Meetings

September 7 (Sun.) to 13 (Sat.).—International Institute of Welding. Annual meeting, at Gothenburg, Sweden.

September 8 (Mon.) and 9 (Tue.).—Permanent Way Institution, London Section. Visits to Woodhead new tunnel works.

September 12 (Fri.).—Railway Club, 57, Fetter Lane, E.C.4, at 7 p.m. "Three Ways to Hastings," by Mr. H. A. Vallance.

September 13 (Sat.).—Railway Students' Association. River Thames Cruise—London Docks, leaving Tower Bridge at 2.30 p.m.

September 17 (Wed.) to October 4 (Sat.).—International Machine Tool Exhibition, at Olympia, London, W.14.